Vol. 1068 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

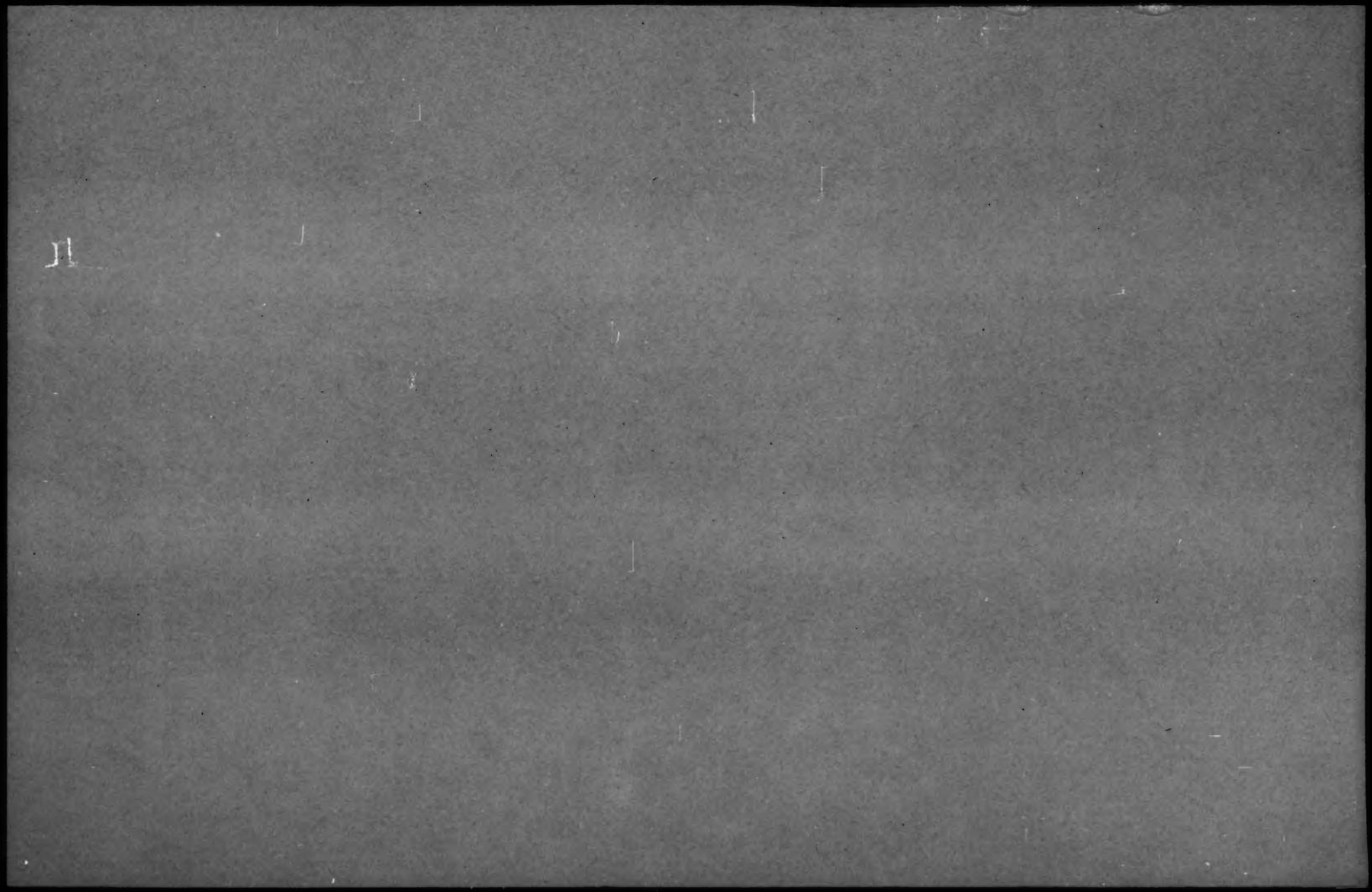
PATENTS

July 22, 1986

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS



OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 22, 1986 Volume 1068 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Mar. 31, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 19, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,393,519 through 4,394,780
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 4, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,327,450	06/232,656	5/04/82
4,327,514	06/247,822	5/04/82
4,327,655	06/229,798	5/04/82
4,327,668	06/225,354	5/04/82
4,327,719	06/216,261	5/04/82
4,327,733	06/229,235	5/04/82
4,327,748	06/226,064	5/04/82
4,327,830	06/230,358	5/04/82
4,327,853	06/224,485	5/04/82
4,327,940	06/233,025	5/04/82
4,328,037	06/220,993	5/04/82
4,328,098	06/260,093	5/04/82
4,328,136	06/275,827	5/04/82
4,328,149	06/218,864	5/04/82
4,328,152	06/216,894	5/04/82
4,328,189	06/253,738	5/04/82
4,328,190	06/225,906	5/04/82
4,328,221	06/220,139	5/04/82
4,328,313	06/232,595	5/04/82
4,328,326	06/223,932	5/04/82
4,328,482	06/226,936	5/04/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,438,032, Re. S.N. 832,901, Filed Feb. 25, 1986, Cl. 260/112R, UNIQUE T-LYMPHOCYTE LINE AND PRODUCTS DERIVED THEREFROM, David W. Golde, et al., Owner of Record: *The Regents of the University of Calif., Berkeley, Calif.,* Attorney or Agent: Bertram I. Rowland, Ex. Gp.: 153

4,453,548, Re. S.N. 866,586, Filed May 22, 1986, Cl. 128/431, METHOD OF IMPROVING SENSORY TOLERANCE WITH MODULATED NERVE STIMULATOR, Donald D. Maurer, et al., Owner of Record: *Empi, Inc., Fridley, Minn.,* Attorney or Agent: Harold J. Kinney, et al., Ex. Gp.: 247

4,464,652, Re. S.N. 811,372, Filed Dec. 20, 1985, Cl. 340/521, CURSOR CONTROL DEVICE FOR USE WITH DISPLAY SYSTEMS, William D. Atkinson, Owner of Record: *Apple Computer, Inc., Cupertino, Calif.,* Attorney or Agent: Roger W. Blakely, et al., Ex. Gp.: 264

4,470,447, Re. S.N. 861,965, Filed May 12, 1986, Cl. 164/452, HEAD TOP SURFACE MEASUREMENT UTILIZING SCREEN PARAMETERS IN ELECTROMAGNETIC CASTING, Peter J. Kindlmann, et al., Owner of Record: *Olin Corp., New Haven, Conn.,* Attorney or Agent: Barry L. Kelmachter, et al., Ex. Gp.: 325

4,474,904, Re. S.N. 860,204, Filed May 6, 1986, Cl. 523/146, FOUNDRY MOULDS AND CORES, Peter H. R. B. Lemon, et al., Owner of Record: *Borden (U.K.) Ltd., Southhampton, England,* Attorney or Agent: Frank E. Robbins, Ex. Gp.: 151

4,475,143, Re. S.N. 868,959, Filed May 29, 1986, Cl. 361/306, DECOUPLING CAPACITOR AND METHOD OF MANUFACTURE THEREOF, Jorge M. Hernandez, Owner of Record: *Rogers Corp., Rogers, Conn.,* Attorney or Agent: David S. Fishman, et al., Ex. Gp.: 211

4,514,973, Re. S.N. 856,028, Filed Apr. 25, 1986, Cl. 57/301, MOBILE CLEANING DEVICE FOR OPEN END FRICTION SPINNING MACHINES, Fritz Stahlecker, Owner of Record: *Hans Stahlecker, Suessen, Federal Republic Germany,* Attorney or Agent: Jerry E. Hyland, et al., Ex. Gp.: 245

4,527,447, Re. S.N. 864,388, Filed May 19, 1986, Cl. 74/866, AUTOMATIC MECHANICAL TRANSMISSION SYSTEM, Elmer A. Richards, Owner of Record: *Eaton Corp., Cleveland, Ohio,* Attorney or Agent: H. D. Gordon, Ex. Gp.: 352

4,530,404, Re. S.N. 865,375, Filed May 21, 1986, Cl. 164/467, PROCESS FOR THE ELECTROMAGNETIC CASTING OF METALS INVOLVING THE USE OF AT LEAST ONE MAGNETIC FIELD WHICH DIFFERS FROM THE FIELD OF CONFINEMENT, Charles Vives, Owner of Record: *Aluminum Pechiney, Paris, France,* Attorney or Agent: Dugald S. McDougall, et al., Ex. Gp.: 325

4,557,395, Re. S.N. 859,507, Filed May 5, 1986, Cl. 220/86R, PORTABLE CONTAINER WITH INTERLOCKING FUNNEL, Victor A. Delay, Jr., Owner of Record: *Inventor,* Attorney or Agent: Stanley M. Miller, Ex. Gp.: 241

4,559,769, Re. S.N. 854,939, Filed Apr. 23, 1986, Cl. 56/295, CUTTER BLADE FOR PNEUMATICALLY TRANSPORTING GRASS CLIPPINGS, Carl E. Seyerle, Owner of Record: *Outboard Marine Corp., Waukegan, Ill.,* Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 333

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Use of Restricted Deposit Account for Electronic Ordering of Patent and Trademark Copies

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of $300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of $1,000.00

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents

and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the $1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscriptions and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557-3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557-3227.

THERESA A. BRELSFORD,
Assistant Commissioner,
for Administration.

June 23, 1986.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Acorn Software Products, Inc., Washington, D.C., Reg. No. 1,263,452, for the mark "THE LIBERTY SOFTWARE CO.", Canc. No. 14,855.

Baumco Gesellschaft Fur Anlagentechnik mbH, Ellison Park, Pa., Reg. No. 1,027,187, for the mark "B BAUMCO AND DESIGN", Canc. No. 15,444.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Body Language, Inc., Phoenix, Ariz., Reg. No. 1,140,755, for the mark "BODY LANGUAGE AND DESIGN", Canc. No. 15,021.

Information Control Systems, Inc., Ann Arbor, Mich., Reg. No. 910,408, for the mark "ICS AND DESIGN", Canc. No. 15,440.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Tony Reyes, dba El Sol Spanish Food Products, Los Angeles, Calif., Reg. No. 892,539, for the mark "EL SOL THE HAPPY TORTILLA AND DESIGN", Canc. No. 15,189.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Copa Shoe Co., Inc., South Plainfield, N.J. Reg. No. 1,199,635, for the mark "VAQUEIRO BOOTS", Canc. No. 15,465.

Linda Ruzzi Associates, Inc., Farmingdale, N.Y., Reg. No. 1,281,719, for the mark "JUST LIKE DADDY", Canc. No. 15,482.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Subscription Pricing Information

The subscription prices on the following publications have been changed as indicated below:

Title: Official Gazette, Patent Section

First-class domesitc mailing	$384.00
Fourth-class domestic mailing	270.00
Fourth-class foreign mailing	337.50
Single copies each, domestic	18.00
Single copies each foreign	22.00

Title: Official Gazette, Trademark Section

First-class domestic mailing	246.00
Surface mailing, foreign	307.50
Single copies each, domestic	7.00
Single copies, foreign	8.75

This change is effective with Government periodicals and Subscription Services Price List 36, dated Summer, 1986.

Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order. Subscriptions can also be charged to your Master Charge or VISA, include your Account Number and expiration date.

This notice supersedes the notice published June 10, 1986, at 1067 OG 12, and 1067 TMOG 13.

June 25, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner,
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of July 22, 1986

4,290,269	4,553,982	4,569,191	4,578,110
4,384,112	4,555,237	4,569,499	4,578,134
4,411,165	4,555,412	4,569,948	4,578,217
4,425,642	4,556,085	4,570,259	4,578,264
4,430,548	4,557,061	4,570,314	4,578,327
4,434,213	4,557,424	4,570,638	4,578,846
4,439,249	4,557,900	4,570,755	4,578,915
4,463,805	4,558,130	4,571,231	4,579,047
4,466,861	4,558,330	4,571,330	4,579,118
4,477,163	4,558,933	4,571,424	4,579,126
4,479,716	4,559,079	4,571,472	4,579,195
4,483,993	4,559,084	4,572,061	4,579,372
4,490,628	4,559,243	4,572,208	4,579,378
4,495,056	4,559,677	4,572,369	4,579,764
4,500,322	4,560,001	4,572,444	4,579,771
4,502,847	4,560,655	4,572,893	4,579,833
4,508,734	4,561,659	4,572,930	4,579,962
4,515,236	4,562,532	4,573,109	4,580,058
4,529,054	4,562,568	4,573,757	4,580,459
4,533,760	4,562,597	4,573,924	4,580,642
4,534,342	4,564,672	4,574,420	4,581,569
4,534,875	4,564,841	4,574,604	4,581,622
4,535,793	4,565,393	4,574,897	4,581,710
4,537,723	4,565,465	4,574,968	4,581,722
4,538,264	4,566,132	4,575,425	4,581,748
4,538,892	4,566,510	4,575,504	4,581,821
4,542,496	4,566,517	4,575,530	4,582,028
4,542,845	4,566,531	4,575,622	4,582,258
4,543,537	4,566,787	4,576,073	4,582,774
4,544,305	4,566,993	4,576,291	4,583,030
4,545,933	4,567,541	4,576,342	4,583,179
4,547,256	4,568,132	4,576,697	4,583,262
4,548,702	4,568,237	4,577,242	4,583,320
4,550,830	4,568,332	4,577,360	4,584,961
4,551,400	4,568,370	4,577,417	
4,552,757	4,568,665	4,578,008	
4,552,869	4,568,966	4,578,097	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2432
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 21, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	10-12-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-18-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-28-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	2-13-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-30-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-06-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-31-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during June 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,447,160 to 3,452,361, inclusive

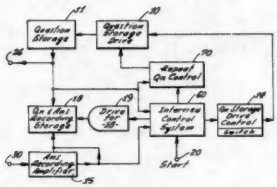
Plant Patents ..... Numbers 2,890 to 2,896 inclusive

REEXAMINATIONS

JULY 22, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,747,228 (532nd)
INTERVIEW MACHINE
Yujiro Yamamoto, 18611 Newton Ave., Santa Ana, Calif.
Reexamination Request No. 90/000,011, Jul. 1, 1981.
Reexamination Certificate for Patent No. 3,747,228, issued Jul. 24, 1973, Ser. No. 198,527, Nov. 15, 1971.
Continuation of Ser. No. 880,875, Nov. 28, 1969, abandoned. This application Jul. 1, 1981, Ser. No. 198,527
Int. Cl.[4] G09B *7/00*
U.S. Cl. 434—320



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4, 7 and 8 are cancelled.

Claim 5 is determined to be patentable as amended.

Claim 6 dependent on an amended claim, is determined to be patentable.

5. [The interview machine of claim **2** wherein] *An interview machine comprising:*

a question storage tape adapted for storing a series of questions to be asked of an interviewee, having associated drive means for selectively starting and stopping the tape, and also having associated means operable when the tape is running for reading a stored question from the tape and transmitting it in audible form to the interviewee;

an answer storage tape adapted for storing a series of answers given by the interviewee, and having associated means responsive to an answer in audible form for storing it on the answer tape;

manually operable means for starting said question storage tape in the first instance, so as to generate the first question of the series;

timing and control means including

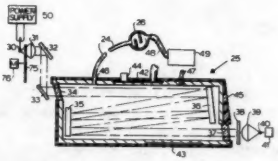
a. first means responsive if the question is not answered within a predetermined period of time for causing the question storage tape to automatically generate the next question of the series,

b. second means responsive to an answer that is initiated before commencement of the next question for stopping the question storage tape, and

c. third means responsive while an answer is being given for keeping the question storage tape stopped, and responsive to the end of an answer for re-starting the question storage tape, whereby the interviewee upon initiating his answer within said predetermined period of time may give as long an answer as he desires, and upon completion of his answer the machine automatically generates the next question of the series; and

said timing and control means [includes] *including* an "and" circuit having inputs coupled to the output of said question storage tape and the input of said answer storage tape and an output coupled to said drive means, said "and" circuit being responsive to the absence of a question concurrent with the presence of an answer for stopping the question storage tape.

B1 3,792,272 (533rd)
BREATH TEST DEVICE FOR ORGANIC COMPONENTS, INCLUDING ALCOHOL
Richard A. Harte, Redwood City; Edwin A. Amstutz, Santa Clara; Achille M. Bigliardi, III, San Jose, and William M. Johnson, Palo Alto, all of Calif., assignors to CMI Inc., Minturn, Colo.
Reexamination Request No. 90/000,791, May 31, 1985.
Reexamination Certificate for Patent No. 3,792,272, issued Feb. 12, 1974, Ser. No. 323,295, Jan. 12, 1973.
Continuation-in-part of Ser. No. 212,522, Dec. 27, 1971, abandoned. This application May 31, 1985, Ser. No. 323,295
Int. Cl.[4] G01N *21/63*
U.S. Cl. 250—343



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–20 are cancelled.

New claims **21–23** are added and determined to be patentable.

21. A system for determining the amount of an organic compound containing carbon and hydrogen and having a substantial vapor pressure at not over 100° C. and being present in human breath, including in combination:

a source of highly stable radiant energy in the near infrared range and of predetermined wavelength;

means for modulating said energy to a fixed modulation frequency;

means to collimate and direct a beam of said energy along a desired path;

a receptacle open to ambient air and adapted to contain an amount of vapor to be tested for such amount of compound and having ingress and egress means for said beam of said directed energy;

an air pump for aiding in evacuating the organic compound from the receptacle by pumping ambient air into the receptacle;

mirror means for providing a folded, fixed-length path traveled by said beam between said ingress and egress means, said path in itself imparting no loss in said energy, so that energy loss along said path is due solely to the presence of said compound;

heater means and thermostat means for maintaining the interior of said receptacle at a fixed predetermined temperature above breath temperature, to prevent breath moisture condensation and to prevent loss of said organic compound in the condensate;

means for indicating that said fixed predetermined temperature has been reached;

a breath tube to introduce the breath into said receptacle;

means for insuring that a deep lung sample is provided;
means for indicating that an adequate breath pressure is being applied;
means for heating said breath tube;
a radiation detector in the path of said beam and said egress means to initiate an electrical signal;
means to amplify and process said electrical signal;
means for electrically filtering said signal in a narrow band centered at said modulation frequency;
digital readout means for providing a digital readout of the filtered, amplified and processed signal as an expression of the amount of said compound in said breath; and
a printer responsive to said processed signal for printing information concerning the amount of said compound.

B1 3,817,362 (534th)
TORSION DAMPING DEVICE
Michel Rist, Boulogne, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France
Reexamination Request No. 90/000,867, Sep. 20, 1985.
Reexamination Certificate for Patent No. 3,817,362, issued Jun. 18, 1974, Ser. No. 306,433, Nov. 14, 1972.
Filed Sep. 20, 1985, Ser. No. 306,433
Claims priority, application France, Nov. 29, 1971, 71.42623
Int. Cl.[4] F16D *3/14, 47/02*
U.S. Cl. 192—106.1

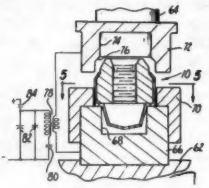
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

New claims **9–19** are added and determined to be patentable.

1. A torsion damping device for coupling together two parts for rotation with an elastically braked angular displacement, one of said parts comprising a central plate, the other of said parts comprising lateral plates disposed on each side of said central plate, said central plate having passage means therein, spacing means interconnecting said lateral plates and passing through said passage means with an angular clearance defining said displacement in both directions, said plates having windows facing each other, torsion damping springs in said windows for coupling together said plates for rotation while offering an elastic resistance to said displacement, said passage means being constituted by an extension of the windows in said central plate.

B1 4,123,961 (535th)
WHEEL NUT WITH WELDED CAP
Albert A. Jadach, Royal Oak, Mich., assignor to Towne Robinson Fastener Company, Southfield, Mich.
Reexamination Request Nos. 90/000,694, Dec. 20, 1984 and 90/000,704, Jan. 8, 1985.
Reexamination Certificate for Patent No. 4,123,961, issued Nov. 7, 1978, Ser. No. 672,746, Apr. 1, 1976.
Filed Dec. 20, 1984, Ser. No. 672,746
Int. Cl.[4] F16B *37/14*
U.S. Cl. 411—429



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **5–10** are determined to be patentable as amended.

Claims **2–4**, dependent on an amended claim, are determined to be patentable.

1. A *decorative* nut *for holding a wheel on a motor vehicle and exposed to view on the wheel, said nut* having a central threaded aperture, polygonal sides, a first end adapted to engage a wheel, a second end *opposite said first end and* having an end face extending at right angles to the axis of the nut, and a sheet metal cap for the nut *and* having a section extending over the polygonal sides *of the nut* and [and] *an* end section adapted to cover the second end of the nut, *said section extending over the polygonal nut sides including a plurality of cap wrench flats respectively associated with and oppositely facing said polygonal nut sides, said cap wrench flats and said polygonal nut sides being disposed between said first and second ends of said nut,* said end section being connected to the section of the cap which covers the polygonal *nut* sides by a section formed fully around the perimeter of the cap and having an extension at right angles to the axis of the nut so as to be parallel to said end face, such connecting section being in juxtaposed contact throughout a substantial area with and welded to said end face, [whereby forces exerted on the capped sides creating moments about the central axis of the nut will result in shear forces exerted on the weld.] *the position of welded contact between the connecting section and the end face resulting in shear forces being applied to the weld in response to the application of forces on the capped wrench flats which create moments about the central axis of the nut.*

B1 4,220,283 (536th)
VEGETATION SPRINKLER HAVING A HAND ADJUSTMENT TO DIRECT THE SPRAY
Manning Citron, San Marino, Calif., assignor to Champion Brass Mfg. Co., Los Angeles, Calif.
Reexamination Request No. 90/000,894, Oct. 30, 1985.
Reexamination Certificate for Patent No. 4,220,283, issued Sep. 2, 1980, Ser. No. 45,390, Jun. 4, 1979.
Filed Oct. 30, 1985, Ser. No. 45,390
Int. Cl.[4] B05B *15/10*
U.S. Cl. 239—205

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–28** is confirmed.

1. In a pop-up sprinkler,

a housing having a lower end for connection to a water supply,

an opening in said lower end to permit the flow of water therein,

an opening at an upper end opposite said lower end,

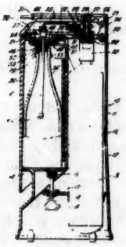
a riser slidably and rotatably engaged in said upper end and within said housing,

said upper end being substantially closed when said riser is therein,

a coil spring extending around said riser within the housing,

an upper end of said spring acting on a portion associated with said housing, the lower end of said spring acting on a portion associated with said riser, said spring normally holding said riser in a predetermined position substantially within said housing,

a spray nozzle forming an upper end on said riser adjacent said upper end of said housing, said nozzle and said housing upper end being adjacent when said spring is holding said riser within said housing,



said nozzle having a passage therethrough connected to a passage in said riser extending from a lower end thereof,

a relatively small opening in said riser passage to said nozzle passage, said riser having surface area to form sufficient surface thereon within said housing so that water entering said housing lower end opening at a predetermined pressure will move said riser against the force of said spring upwardly to extend the spray nozzle outwardly of said housing,

means adjacent said upper end opening of said housing being smaller than said portion associated with said riser to retain a part of said riser within said housing when said water has moved it to extend outwardly of the housing to its fully extended position,

the improvement comprising:

first means associated with said riser and second means associated with said housing,

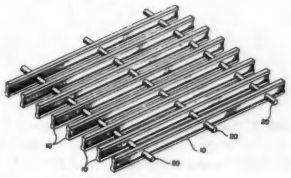
said first and second means being engaged for relative rotation in predetermined selected amounts of arc when said riser is hand rotated in said housing for positioning the direction of spray from said nozzle.

B1 4,244,768 (537th)

METHOD OF MANUFACTURING A GRATING CONSTRUCTED OF RESIN BONDED FIBERS

Joseph W. Wiechowski, San Clemente; Delmar S. Miller, Newport Beach, and Richard C. Kostner, Orange, all of Calif., assignors to Poly-Trusions, Inc., Newport Beach, Calif.

Reexamination Request No. 90/000,475, Dec. 5, 1983.
Reexamination Certificate for Patent No. 4,244,768, issued Jan. 13, 1981, Ser. No. 863,766, Dec. 23, 1977.
Filed Dec. 5, 1983, Ser. No. 863,766
Int. Cl.⁴ E04C *2/22, 2/42*
U.S. Cl. 156—293



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–17** are cancelled.

[1. A method of manufacturing a grating constructed of resin bonded fibers, comprising the steps of:

extending a plurality of dowels through registered apertures in a plurality of I-elements, said apertures being substantially the same size as the cross-sectional size of the dowels;

applying to the dowels adjacent to the I-elements a heat setting adhesive which has a long pot life of about an hour or more at ambient temperature and which becomes highly fluid for several seconds and then heat sets in several seconds when heated to a flow temperature of about 100° F. or more;

heating the dowel and the I-element intersection areas, including adhesive, to said predetermined flow temperature to thereby cause the adhesive to become highly fluid thereby wetting the surface of the dowel and flowing by capillary action into the interior of the aperture in the I-element and thereafter heat setting to bond the dowel to the I-element.**]**

B1 4,298,551 (538th)

APPLIANCE FOR MAKING AN AERATED BEVERAGE

Rune F. R. Adolfsson, Stockholm, and Dietrich W. Gellert, Ekero, both of Sweden, assignors to Thorn Svenska A.B., Solna, Sweden

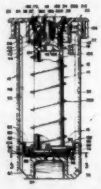
Reexamination Request No. 90/000,873, Oct. 4, 1985.
Reexamination Certificate for Patent No. 4,298,551, issued Nov. 3, 1981, Ser. No. 62,943, Aug. 2, 1979.
Filed Oct. 4, 1985, Ser. No. 62,943
Claims priority, application Sweden, Aug. 2, 1978, 7808346
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—121 R

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–11** are now disclaimed.

[1. An appliance for making an aerated beverage comprising a casing, means for mounting a container of pressurized carbon dioxide in said casing, a manually operable valve to control the outflow of carbon dioxide from said container, a

nozzle connected to said manually operable valve to receive carbon dioxide from said valve, means for mounting a bottle containing water, so that the nozzle is immersed in the water in said bottle, a flexible diaphragm surrounding the upper end of the nozzle, a stopper carried by the diaphragm and closing the neck of the bottle when so mounted, a space formed above the diaphragm communicating with the interior of the bottle when



mounted with the stopper in its neck, the upwardly projected area of the diaphragm forming a wall of said space being greater than the downwardly projected area of said stopper, whereby the pressure of the carbon dioxide urges the stopper into engagement with the neck of the bottle, and an overpressure safety valve communicating with the space above the diaphragm.]

B1 4,404,158 (539th)

METHOD OF MAKING A BUILDING PANEL

Ralph C. Robinson, Redmond, Wash., assignor to Olympian Stone Company, Redmond, Wash.

Reexamination Request No. 90/000,488, Jan. 19, 1984.
Reexamination Certificate for Patent No. 4,404,158, issued Sep. 13, 1983, Ser. No. 97,197, Nov. 26, 1979.
Filed Jan. 19, 1984, Ser. No. 97,197
Int. Cl.[4] B28B *21/44, 21/70;* **B29C** *39/10, 41/22*
U.S. Cl. 264—263

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are cancelled.

[1. A method of forming a building panel from a plurality of relatively thin, pre-sized panels of a selected facing material such as granite or marble, comprising the steps of:

(a) placing the panels of the selected facing material face down into a supporting form;

(b) placing sealing means between adjacent edges of said panels and said form;

(c) securing anchors to the back surface of each panel of said facing material;

(d) applying connectional bond breaker to the back surface of each panel;

(e) forming a slurry of concrete and chopped glass fiber strands;

(f) spraying the slurry directly on the back surface of said panels of facing material to cover said panels and said anchors to form an integral, panel supporting frame; and,

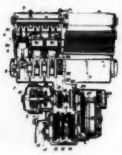
(g) curing said slurry and removing the completed building panel from said supporting form.]

B1 4,462,482 (540th)

MOTORIZED TWO-WHEELED VEHICLE

Masaharu Tsuboi, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Reexamination Request No. 90/000,887, Oct. 15, 1985.
Reexamination Certificate for Patent No. 4,462,482, issued Jul. 31, 1984, Ser. No. 350,350, Feb. 19, 1982.
Continuation of Ser. No. 101,110, Jun. 11, 1979, Pat. No. 4,331,212. This application Oct. 15, 1985, Ser. No. 350,350
Claims priority, application Japan, Sep. 25, 1977, 52-143214; Sep. 29, 1977, 52-129232
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.
Int. Cl.[4] B60K *5/04*
U.S. Cl. 180—230



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

1. A motorized two-wheeled vehicle comprising a vehicle body frame having a front wheel and a rear wheel, an approximately vertically extending multiple-cylinder internal combustion engine positioned adjacent said front wheel and having a crankcase, and a bottom portion, a transmission positioned rearwardly of said engine and driven thereby, said transmission having an output shaft operatively coupled to drive said rear wheel and a casing formed integrally with said crankcase of said engine, a laterally extending crank shaft having a given width in the bottom portion of said engine and having a middle portion, a laterally extending input shaft on a front portion of said transmission, a laterally extending intermediate shaft constituting a driving shaft for said input shaft incorporated between said crank shaft and said input shaft and located above said crank shaft, said intermediate shaft having end portions and a middle portion, power transmission means interconnecting said crank shaft and said intermediate shaft, and an A.C. generator provided on one end portion of said intermediate shaft, said intermediate shaft and said A.C. generator having a total length within the width of said crank shaft.

B1 4,478,889 (541st)

PROCESS FOR PREPARATION OF COATED PLASTIC CONTAINER

Yoshitsugu Maruhashi, Yokohama; Isao Tanikawa, Ayase, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo

Reexamination Request No. 90/000,839, Aug. 19, 1985.
Reexamination Certificate for Patent No. 4,478,889, issued Oct. 23, 1984, Ser. No. 438,758, Nov. 3, 1982.
Filed Aug. 19, 1985, Ser. No. 438,758
Claims priority, application Japan, Nov. 5, 1981, 56-176368
Int. Cl.[4] B05D *7/22*
U.S. Cl. 427—230

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

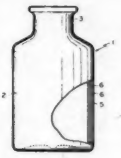
Claim **6** is cancelled.

Claim 1 is determined to be patentable as amended.

Claims 2–5 and 7–13, dependent on an amended claim, are determined to be patentable.

New claim 14 is added and determined to be patentable.

1. A process for the preparation of a coated plastic container, which comprises coating an aqueous latex or organic solvent solution of *a polymer consisting essentially of* a vinylidene chloride copolymer on at least one surface of a plastic container formed by hot molding of a thermoplastic resin, drying the coating and heat-treating the coating *layer consisting essentially of the vinylidene chloride copolymer* simultaneously with or subsequently to the drying step *in the substantial absence of water or the organic solvent* to crystallize the coating until the degree of crystallization is at least [0.5] *0.8* as measured according to the infrared absorption spectrum method *and*



cooling the crystallized coating at a cooling rate of at least 2° C./min.

REISSUES

JULY 22, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,210

DEVICE FOR EJECTING THE REMOVABLE TIP OF A PIPETTE

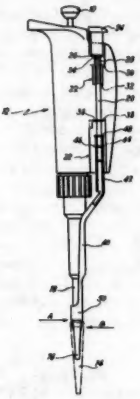
Eric J. H. d'Autry, 69,72, rue Gambetta Boite Postale 45, 95400 Villiers-Le-Bel, France

Original No. 3,991,617, dated Nov. 16, 1976, Ser. No. 622,317, Oct. 14, 1975. Application for reissue Feb. 28, 1978, Ser. No. 882,279

Claims priority, application France, Oct. 15, 1974, 74 34588

Int. Cl.[4] B01L *3/02*

U.S. Cl. 73—864.14 **12 Claims**



1. Device for ejecting the removable tip of a pipette, [the] *a* lower *tubular* end of which terminates in the form of a conical part intended to receive said removable tip by friction, in particular of a micro-pipette, [characterised] *characterized* by the fact it comprises in combination:

a rod which is incorporated in a passage provided in the body of the pipette, said passage and said rod being arranged so as to be able to impart to the latter a movement of translation parallel to the axis of the pipette;

means allowing said rod to move along a certain path limited in the upwards and downwards direction;

resilient means permanently urging said rod in an upwards direction;

a removable ejection member comprising an upper part, a central part and a lower end, said upper part being removably fitted together with the lower part of said rod in an abutment relationship, said central part being located in the vicinity of the pipette, and said lower end terminating in the form of guiding and ejection means in order to surround at least partly the lower tubular end of the pipette in the vicinity of its conical part, the lower end of said ejection member in its upper position not reaching the upper limit of the removable tip when the latter is put in position by friction,

at its upper end, the rod comprises a push button which, when actuated, moves the ejection member downwards thus causing the ejection of the removable tip, the rod also comprises, in the vicinity of its upper end and below the push button, a stop-ring fulfilling the function of an upper abutment for said resilient means comprising a coil spring surrounding said rod, said spring bearing by its lower end against a shoulder provided in the passage of the pipette body.

Re. 32,211

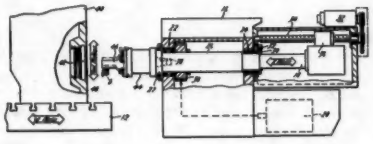
MACHINE TOOL AND METHOD

Richard A. Jerue, Bloomfield Hills, and Robert M. Ortlieb, Southfield, both of Mich., assignors to DeVlieg Machine Company, Royal Oak, Mich.

Original No. 4,250,775, dated Feb. 17, 1981, Ser. No. 69,583, Aug. 24, 1979. Continuation of Ser. No. 467,331, Feb. 17, 1983, abandoned, and a continuation of Ser. No. 927,564, Jul. 24, 1978, abandoned. Application for reissue Feb. 6, 1985, Ser. No. 698,748

Int. Cl.[4] B23B *29/034*

U.S. Cl. 82—1.2 **2 Claims**



9. In a *four-axis bar-type* machine tool including a rotatable spindle *bar* having a free end and being movable longitudinally along its axis of rotation, spindle *bar* drive means for rotating said spindle *bar*, spindle *bar* actuating means for moving said spindle *bar* along said axis, a workpiece supporting table movable along a path *generally parallel with said axis*, and table drive means for moving said table along said path, the improvement comprising means for generating numerically controlled *contours such as* threads, and including:

(1) a machining head mounted at the free end of said spindle *bar*, said head comprising

(a) means for mounting a single point tool thereon so that said tool will rotate with said spindle *bar*; and

(b) means for moving the tool on said head radially outwardly with respect to said axis in direct response to axial movement of said spindle *bar* in one direction, and for moving the tool radially inwardly with respect to said axis in direct response to axial movement of said spindle *bar* in the opposite direction;

(2) position sensing means for the rotational position of said spindle *bar* under all operating conditions thereof; and

(3) numerical control means programmed to cause said table drive means to operate *along said path simultaneously and* in a predetermined relationship with *the rotational position of said spindle bar as sensed by* said position sensing means to machine a contour on a workpiece disposed on said table, when said spindle *bar* is rotating[.]*;*

(4) said spindle bar actuating means comprising mechanical actuation means for providing direct and positive control of the position of said spindle bar along said axis in response to said numeral control means.

Re. 32,212

COMPLIANT BACKPLANE ELECTRICAL CONNECTOR

Leo Walter, Palos Verdes Estates, and Helmut W. Greul, Malibu, both of Calif., assignors to Electronics Stamping Corporation, Rancho Dominguez, Calif.

Original No. 4,223,970, dated Sep. 23, 1980, Ser. No. 15,540, Feb. 26, 1979. Continuation of Ser. No. 420,720, Sep. 21, 1982, abandoned. Application for reissue Oct. 22, 1984, Ser. No. 663,817

Int. Cl.[4] H05K *1/04*

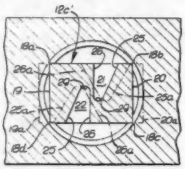
U.S. Cl. 339—17 C **14 Claims**

12. In a compliant electrical connector adapted to be pressed

into a hole formed by surrounding structure, the combination comprising:

(a) an axially elongated pin having edge portions to forcibly grip said structure at the boundary of the hole as the pin is inserted into the hole,

(b) the pin having first and second elongated grooves respectively sunk in opposite sides thereof, the full depth of each groove along a substantial portion of its length being greater than one-half the thickness of the section between said opposite sides of the pin, the grooves extending axially of the pin and configured to locally weaken the pin so that at least one



flexure is formed by the pin to extend axially thereof between and adjacent the grooves and along the groove length,

(c) the flexure adapted to yieldably flex in response to insertion of the pin into the hole and progressive gripping of said structure by pin edge portions, thereby to reduce the cross-sectional area of that groove in response to insertion of the pin into the hole,

(d) at least one of said grooves having side walls forming generally V-shaped cross-sections along major extent of the groove and in planes normal to said axis, the depth of the groove accommodating relative movement of said walls toward one another in response to said insertion of the pin into said hole.

Re. 32,213

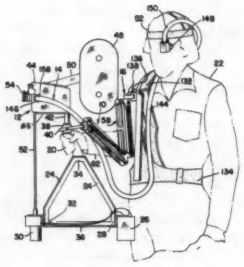
EQUIPMENT FOR USE WITH HAND HELD MOTION PICTURE CAMERAS

Garrett W. Brown, 1845 Walnut St., Philadelphia, Pa. 19103

Original No. 4,017,168, dated Apr. 12, 1977, Ser. No. 506,326, Sep. 16, 1974. Application for reissue Jan. 9, 1981, Ser. No. 223,939

Int. Cl.[3] G03B *17/00*

U.S. Cl. 352—243 **70 Claims**



1. A portable camera equipment system especially adapted for operation by a cameraman in motion and capable of being hand-guided, the system being of improved stability against angular deviations in pan, tilt and roll, and substantially free-floating in a manner to *also* isolate the equipment [also] from unwanted lateral and vertical movement caused by the motion of the cameraman using the equipment which comprises *in combination*;

camera equipment components positioned in an expanded balanced arrangement at points remote from each other *for increasing inherent inertial stability and for providing access to the center or the approximate center of gravity and to the center or the approximate center of the moment of inertia of the mass of the components comprising the expanded camera equipment* and about a handle means for guiding the camera equipment, which means is positioned at or approximately at [the] i said center of gravity [and at or approximately at the center of the moment of inertia of the mass of the components comprising the expanded camera equipment];

camera equipment support means [adapted to support] *for supporting* at least part of the weight of the camera equipment [which means is adapted to be pivotally and rotatably connected] *and for substantially freeing the cameraman's hands from the weight of the camera equipment and for pivotable and rotatable connection* to the cameraman and [is connected] to the camera equipment, [said means substantially freeing the cameraman's hands from the weight of the camera equipment] *for*, isolating and free-floating the camera equipment at a distance from the cameraman substantially independently of any of his unwanted lateral and vertical motions and [capable of] *for* being guided to a position in space in a range of positions selected by the cameraman;

pivotable and rotatable means *for* interconnecting *the center or the approximate center of gravity of* the camera equipment with the support means [to permit] *for virtually frictionless* rotatable and pivotal movement of the camera equipment relative to the support means [and which thereby virtually does not transmit deviations in the pan, tilt and roll axes from the cameraman to the camera equipment;] ep *about three perpendicular axes, whereby the camera is virtually isolated from deviations in the pan, tilt and roll axes caused by a cameraman in motion* and

view finding means adapted [to indicate] *for indicating* the field of view of the camera to the cameraman without the need for his eye to be in direct contact with the camera.

Re. 32,214

PISTOL-TYPE SYRINGE

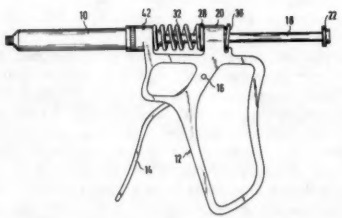
Heinrich W. Schramm, Steinhagen, Fed. Rep. of Germany, assignor to Henke-Sass, Wolf GmbH, Tuttlingen, Fed. Rep. of Germany

Original No. 4,368,731, dated Jan. 18, 1983, Ser. No. 233,690, Feb. 12, 1981. Application for reissue Jan. 17, 1985, Ser. No. 692,347

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 8003633; Sep. 8, 1980, 8023910

Int. Cl.[4] A61M *5/245*

U.S. Cl. 604—232 **21 Claims**



14. A syringe for injecting the contents of an ampoule having therein a piston which discharges the ampoule contents upon axial displacement, said syringe comprising:

means for holding an ampoule;

a plunger longitudinally displaceable along a path extending through said ampoule holding means;

said holding means including at least one window through which an ampoule in said holding means may be observed; and

a transparent intermediate member positioned in said ampoule holding means so as to be located between said window and an ampoule disposed therein, wherein said transparent intermediate member is a tube positioned in said ampoule holding means to surround an ampoule disposed therein.

Re. 32,215

SUBSTITUTED PHENOXYBENZOIC ACIDS COMPOSITIONS OF THE SAME AND HERBICIDAL USE THEREOF

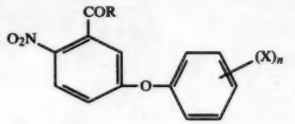
Robert J. Theissen, Bridgewater, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France

Original No. 4,164,409, dated Aug. 14, 1979, Ser. No. 903,271, May 5, 1978. Continuation of Ser. No. 279,274, Jun. 25, 1981, abandoned, and a continuation of Ser. No. 837,957, Sep. 29, 1977, abandoned, which is a continuation of Ser. No. 702,367, Jul. 2, 1976, which is a continuation-in-part of Ser. No. 617,569, Sep. 29, 1976, which is a continuation of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830, which is a continuation of Ser. No. 114,712, Feb. 11, 1971, Pat. No. 3,784,635, which is a continuation-in-part of Ser. No. 819,412, Apr. 25, 1969, Pat. No. 3,652,645, said Ser. No. 702,367, is a continuation-in-part of Ser. No. 545,232, Jan. 29, 1975, Pat. No. 4,002,662, which is a continuation-in-part of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830. Application for reissue Feb. 23, 1983, Ser. No. 469,563

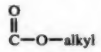
Int. Cl.[4] A01N *33/22;* C07C *79/35*

U.S. Cl. 71—98 **3 Claims**

4. Herbicidal compounds having the formula:



wherein $(X)_n$ is a combination of the members selected from the group consisting of halogen, trifluoromethyl, COOH,



(alkyl of 1 to 4 carbon atoms), hydroxy, alkoxy of 1 to 4 carbon atoms,

SH, SR_1, SOR_1, SO_2R_1, SO_2NH_2, R_1 and R_2 are selected from the group consisting of alkyl of 1 to 4 carbon atoms, R is hydroxy, and n is an integer of 2 to 5.

PLANT PATENTS

GRANTED JULY 22, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,768

ROSE PLANT RUIPIKO

Gijsbert de Ruiter, Ab Hazerswoude, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Nov. 2, 1984, Ser. No. 667,636
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its dwarf, compact, free blooming plant, producing Tyrian rose blooms approximately 1" across, of heavy substance, suitable for use as a pot plant.

5,769

ROSE PLANT INTERRO

G. Peter Ilsink, Leersum, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Nov. 1, 1984, Ser. No. 667,126
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its ability to bloom when very small, easy propagation by cuttings, cherry red blooms borne in clusters, stiff petals and clean foliage.

5,770

ROSE PLANT RUIMIRED

Gijsbert De Ruiter, AB Hazerswoude, Netherlands, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Nov. 2, 1984, Ser. No. 667,635
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its dwarf compact, free blooming plant, producing blooms of Orient Red, approximately 1" in diameter, with petals of heavy substance, and suitable for use as a pot plant.

5,771

GRAPEVINE-ST. PEPIN

Elmer Swenson, Osceola, Wis., assignor to Swenson-Smith Vines, Inc., Excelsior, Minn.

Filed Oct. 22, 1984, Ser. No. 663,420
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—47 1 Claim

1. A new and distinct variety of grapevine, substantially as shown and described herein, characterized particularly as to novelty by the unique combination of winter hardiness down to −32° Fahrenheit in central Wisconsin and Minnesota, with grapes of relatively low acidity, high sugar content, a desirable aroma and flavor with an absence of foxiness or labrusca and producing a good quality white wine, as well as being highly desirable in view of its blending qualities.

5,772

MUSHROOM PLANT

Daniel J. Royse, State College, Pa., and Bernard P. May, Groton, N.Y., assignors to Research Corporation, New York, N.Y.

Filed Oct. 19, 1984, Ser. No. 663,098
Int. Cl.[4] A01H *15/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of mushroom plant substantially as shown and described characterized particularly as to novelty by its greater productivity and yield when compared to two commercially available lines, 348 and Moonlite ™ and by its unique electrophoretic isozyme phenotype.

5,773

MUSHROOM PLANT

Daniel J. Royse, State College, Pa., and Bernard P. May, Groton, N.Y., assignors to Research Corporation, New York, N.Y.

Filed Oct. 19, 1984, Ser. No. 663,099
Int. Cl.[4] A01H *15/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of mushroom substantially as shown and described characterized particularly as to novelty by its greater productivity and yield when compared to three commercially available lines 303, 310 and 348 and by its unique electrophoretic isozyme phenotype.

PATENTS

GRANTED JUL. 22, 1986

ERRATA

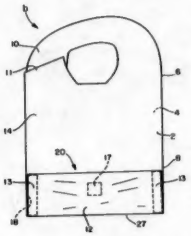
For CLASS	See PATENT NO.
384–054	4,601,521
384–019	4,601,522
530–303	4,601,852
558–281	4,601,858
558–459	4,601,859
424–056	4,601,959
522–007	4,602,076
546–272	4,602,090
549–266	4,602,114

PATENTS

GRANTED JULY 22, 1986

GENERAL AND MECHANICAL

4,601,065
BIB WITH CRUMB CATCHER
Wayne C. Sigl, Neenah; Dan D. Endres, Appleton, and Christine C. Habert, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Continuation-in-part of Ser. No. 638,187, Aug. 6, 1984. This application May 17, 1985, Ser. No. 735,496
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R **16 Claims**

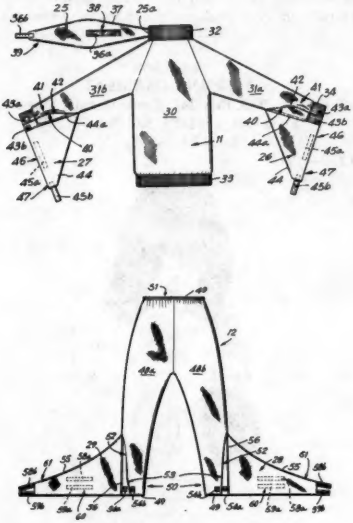


1. A protective garment article, comprising:
(a) a sheet member having an appointed body facing surface, an appointed outward facing surface, an upper end portion and a flexible bottom end portion;
(b) mounting means connected to said sheet member for holding said garment on a wearer;
(c) a flexible, sheet-type catcher member positioned in facing relation with the body facing surface of said sheet member bottom portion; and
(d) attaching means for connecting selected edge portions of said catcher member to said sheet member to form a passive pouch-type structure which opens onto the body facing surface of said sheet member, said attaching means constructed and arranged to constrain and hold said sheet and catcher members to thereby produce a spacer means which operably spaces said catcher member away from the outward facing surface of said sheet member when said connected sheet and catcher members are turned inside out to form an active pouch-type structure which opens onto the outward facing surface of said sheet member.

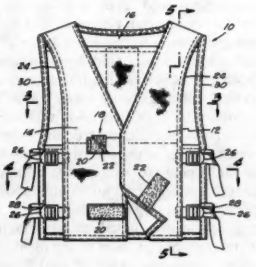
4,601,066
FASHION/EXERCISE GARMENT
Walter A. Campbell, 744 NE. 113th St., Miami, Fla. 33161
Filed Mar. 22, 1985, Ser. No. 715,227
Int. Cl.[4] A41D *1/08, 1/04, 13/00*
U.S. Cl. 2—70 **15 Claims**

1. A two-piece garment to be worn indoors for exercising and dancing, comprising an upper body section and a lower body section, said upper body section having the form of a jersey having sleeves and openings about neck and wrist extremity portions, said lower body section having the form of a pair of tights having legs and openings about ankle extremity portions, and a warmer disposed adjacent one of said extremity portions, said warmer having the form of an elongated tapered binding that extends from, and winds more than once about, the said extremity portion to provide a raised wrap while said taper provides a tight, conforming, streamlined profile to said extremity.

5. A two-piece garment to be worn indoors for exercising and dancing, comprising an upper body section and a lower body section, said upper body section having the form of a jersey having sleeves and openings about neck and wrist extremity portions, said lower body section having the form of a pair of tights having legs and openings about ankle extremity portions, and a plurality of warmers disposed adjacent each extremity portion, each warmer having the form of an elongated tapered binding that extends from, and winds more than once about, its respective extremity portion to provide a raised wrap while said taper provides a tight, conforming, streamlined profile to said extremity.



4,601,067
VEST
Mark Buonassissi, 6128 N. Eastbrook St., Lakewood, Calif. 90712
Filed May 10, 1985, Ser. No. 732,553
Int. Cl.[4] A41D *1/04, 1/00, 13/00;* **F41H** *1/02*
U.S. Cl. 2—102 **3 Claims**



1. A vest having cooling or warming capability as desired for a person's torso by using cold packs or warm packs, comprising:
a back panel;

a plurality of inside pockets extending over the inner surface of said back panel;

an inside pocket formed in the inner surface of a left front panel and an inside pocket formed in the inner surface of a right front panel, each of said front panels being connected at their respective upper ends to said back panel;

fastening means to provide a close fit of the vest around a person's torso, whereby

a person may be cooled or warmed upon insertion of a plurality of cool packs or warm packs in said pockets.

4,601,068

NURSING GARMENT

Doris Frechette, P.O. Box 261, South Dennis, Mass. 02660

Filed Oct. 15, 1985, Ser. No. 787,082

Int. Cl.[4] A41D *1/20*

U.S. Cl. 2—104 **1 Claim**

1. A garment for use by a woman while nursing a child for covering the face of the child and concealing the woman's breasts while the child is nursing, comprising a torso-covering top,

said top including a front portion covering the upper front torso of the wearer,

a pair of pleats in said front portion, said pleats extending longitudinally substantially the length of said front portion, one pleat being located on one side of said front portion to normally extend vertically over one of the breasts of the wearer, and the other pleat being located on the opposite side of said front to normally extend vertically over the other breast of the wearer,

a pair of vertical openings in the top in the front portion thereof, said openings being located in said pleats to extend vertically over the wearer's breasts,

each of said pleats comprising an inner longitudinal fold and an outer longitudinal fold, each fold having inner and outer garment layers, the outer layer of said inner longitudinal fold being common to the inner layer of said outer fold, said outer longitudinal fold being spaced laterally outwardly from and covering said inner longitudinal fold,

each of said vertical openings being formed as a longitudinal slit in said common layer of said folds adjacent said inner longitudinal fold and extending vertically a distance from above the breast to below the breast of the wearer,

means to close said openings, said means comprising pressure responsive hook and loop attachable and detachable members operable by a single hand,

one of said hook and loop attachable and detachable members being located on one portion of the pleat adjacent the opening therein, while the other of said hook and loop attachable and detachable members is located on another separate but cooperating portion of the pleat adjacent the opening,

an opening concealing collar depending from a top edge thereof downwardly past the openings to a point below the openings, the collar being secured at its top edge to the top but being otherwise free thereof, said collar extending laterally past said openings and said pleats on opposite sides of said front.

4,601,069

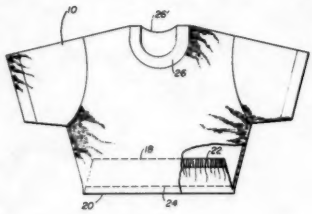
WOMAN'S BARE MIDRIFF GARMENT

Fred W. Fiore, Jr., and Lee B. Fiore, Jr., both of 2477 NW. 89th Dr., Coral Springs, Fla. 33065

Filed Nov. 19, 1984, Ser. No. 672,623

Int. Cl.[4] A41D *1/18*

U.S. Cl. 2—106 **6 Claims**



1. A woman's bare midriff garment, comprising:

(a) an outer shell supported about the shoulders of the wearer, said outer shell handing freely from the shoulders and downward from the armpits, said shell lying across the breasts of the wearer and hanging vertically downward thereform; and

(b) an inverted substantially frusto-conical segment having top and bottom ellipsoidial cross-sections defining a first base end and a second base end, said first base end being smaller than said second base end, the edge of said first base end including an elastic means adapted for the engagement of the torso of the wearer at the top of the rib cage but beneath the bottom of the breasts, the edge of said second base end defining a hanging hem near the bottom of the rib cage, said hem integrally secured to the lower edge of said downwardly hanging portion of said outer shell, said hem in substantially vertical alignment with that portion of said outer shell hanging downward from the armpits of the wearer.

whereby a bare midriff garment in the nature of a tank top is thereby formed, such garment affording to the wearer a stylish garment while preserving the wearer's modesty in the event of vigorous activity which, absent said elastic means for engagement of the upper rib cage, might bring about an undesirable exposure of the wearer's breasts.

4,601,070

NOVELTY SKI HAT

Constantine Sargentini, 11 E. June St., Lindenhurst, N.Y. 11757

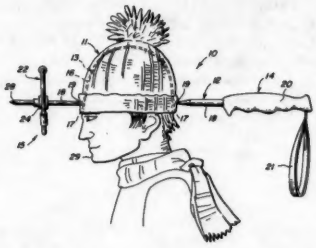
Filed Jun. 17, 1985, Ser. No. 745,868

Int. Cl.[4] A42B *1/06*

U.S. Cl. 2—209 **2 Claims**

1. A novelty ski hat, comprising in combination, a cap and a novelty ski pole extending through said cap, said novelty ski pole extending in a horizontal direction through said cap with a prong unit thereof in front of said cap, and a handle unit thereof at a rear of said cap and propeller means being provided on said novelty ski pole, means for removably connecting one of said units from the ski pole to permit removal of the

ski pole from the cap for placement onto another cap, said ski pole including means to pass between an underside of cap and



underside of a wearer's head, while said units are aligned through a forehead of said wearer.

4,601,071

FLUSH SYSTEM

Bengt A. Persson, Corso Italia 28 B, CH-6911 Campione d'Italia, Switzerland

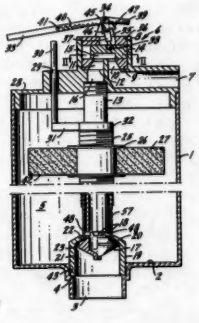
PCT No. PCT/SE84/00313, § 371 Date May 3, 1985, § 102(e) Date May 3, 1985, PCT Pub. No. WO85/01537, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 27, 1984, Ser. No. 740,078

Claims priority, application Sweden, Oct. 5, 1983, 8305455

Int. Cl.[4] E03D 1/18

U.S. Cl. 4—333 **11 Claims**



1. A flushing system which is designed to deliver a given volume of water which is supplied from a water-supply valve (6) to an inlet (7) of an accumulation chamber (5), characterized in that a discharge valve (19) controlled by a float (27) is arranged to be opened when said given volume of water has been delivered to the accumulating chamber and the float (27) is located at a corresponding level in said chamber (5); in that a supply pipe (13) communicating with said inlet extends downwardly in the accumulating chamber (5) towards said outlet (3); in that a valve housing (19) co-acting with said float (27) is slidably arranged, together with said float, on said water supply pipe (13); in that in the closing position of the valve housing, the lower edge part of said valve housing is arranged, in the absence of said given volume of water in the accumulating chamber, to abut or to lie closely adjacent to a seat (4, 43) encircling the outlet (3), in that in the open position of the valve housing, when the accumulating chamber (5) has received said given volume of water, the valve housing is arranged to be lifted relative to the seating by said float (27); in that the lower end of the supply pipe is formed with a valve body (17), arranged together with the inner wall (23) of the valve housing, to form a pressure chamber (24) having at least one leakage opening; and in that the supply pipe is provided above the valve body with at least one supply opening (18) which communicates with the accumulating chamber (5) in the closing position of the valve housing (19), the arrangement being such that when the valve housing (19) is lifted together with the float (27), said supply opening (18) is brought into communication with the pressure chamber (24), whereupon the water under pressure in the pressure chamber lifts the valve housing (19) relative to the valve body (17) to a highest position, in which water in the accumulating chamber (5) can run freely out through the outlet and hold the valve housing (19) in said highest position, at least until the supply of water to the water supply pipe (13) ceases.

4,601,072

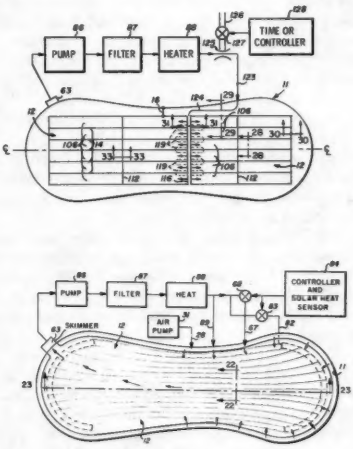
SWIMMING POOL COVER

Harry E. Aine, 1804 Stierlin Rd., Mountain View, Calif. 94040

Division of Ser. No. 70,310, Aug. 27, 1979, abandoned, and Ser. No. 758,021, Jan. 7, 1977, Pat. No. 4,178,690, which is a continuation-in-part of Ser. No. 734,349, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 613,443, Sep. 15, 1975, Pat. No. 4,181,986, which is a continuation-in-part of Ser. No. 367,198, Jun. 5, 1973, abandoned. This application Aug. 15, 1984, Ser. No. 640,867

Int. Cl.[4] E04H 3/19

U.S. Cl. 4—499 **13 Claims**



1. In a swimming pool cover of the type having a cover means which in the covering state floats on and covers at least a portion of the surface of the swimming pool and which includes buoyancy changing means operatively associated with said cover means for changing the buoyancy of at least a portion of said cover means between a positive buoyancy and a negative buoyancy for causing said cover means to switch between said pool covering state and a pool uncovering state, respectively, in response to said change in buoyancy, the improvement wherein:

said buoyancy changing means includes, conduit means for operative association with said cover means for containing a fluid, the buoyancy of said conduit means when containing said fluid being determinative of the covering and uncovering state of said cover means,

means for feeding a fluid through said conduit means, and

means for changing the density of the fluid as fed through said conduit means for changing the buoyancy of at least a portion of said cover means and for causing said cover

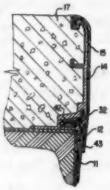
means to switch between said pool covering and pool uncovering states.

4,601,073

SWIMMING POOL COPING SYSTEM

Donald E. Methot, 77F Glenpark Dr., Gloucester, Ontario, Canada (K1B 3Z1)

Continuation of Ser. No. 502,914, Jun. 10, 1983, abandoned. This application May 3, 1985, Ser. No. 729,098
Claims priority, application Canada, Jun. 23, 1982, 405802
Int. Cl.[4] E04H 3/18
U.S. Cl. 4—506 2 Claims



1. A unitary, bead-retaining coping for a vinyl-lined swimming pool having a deck, including:

a sub-coping adapted to be permanently secured to the pool side edge of a swimming pool deck, said sub-coping having an outer vertical face portion, said outer vertical face portion having an upper, inwardly extending element adapted to engage and secure said sub-coping to the top of said deck, said inwardly extending element incorporating an upwardly facing cap-retaining groove;

an intermediate, inwardly extending locking member on said sub-coping below said upper, inwardly extending element and adapted to further secure said sub-coping to said deck;

a lower, inwardly extending portion formed in said vertical face portion of said sub-coping, and forming the upper wall of a bead-retaining groove;

an inwardly extending, horizontal base plate unitarily formed with said lower, inwardly extending portion of said vertical face portion of said sub-coping and forming a lower wall of said bead-retaining groove, said upper and lower walls cooperating to define an inwardly extending liner bead retaining groove, said base plate being adapted to engage the top edge of a pool below its deck;

first and second projections extending upwardly and outwardly, respectively, from said sub-coping base plate and adapted to engage and secure a liner bead of a vinyl swimming pool liner in said retaining groove; and

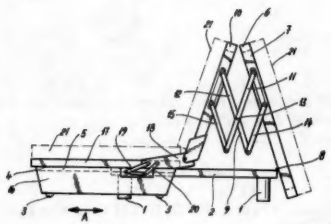
a removable cap for said sub-coping, said cap including a vertical cover member carrying at its upper edge a downwardly extending tongue portion for engaging said upwardly facing cap-retaining groove, and including at its lower portion a downwardly extending bead protection leg and an inwardly extending bead-engaging arm, said inwardly extending bead-engaging arm adapted to extend into said liner bead retaining groove in contact with the upper wall thereof for engaging and securing said liner bead against said lower wall and against at least one of said first and second projections, said cap means being removably attachable to said sub-coping to secure said vinyl pool liner to the top edge of a pool below its deck and to protect the upper bead edge of said liner, said tongue means and said bead-retaining arm cooperating to hold said vertical cover member of said removable cap securely against said vertical face portion of said sub-coping to prevent entry of water therebetween and to hold said downwardly extending bead protection leg securely against a vinyl pool liner to thereby protect the upper edge thereof.

4,601,074

FURNITURE, PARTICULARLY UPHOLSTERED FURNITURE, FOR TRANSFERRING FROM A SITTING POSITION TO A LYING POSITION

Bertram Welsch, Coburg, and Günther Blauw, Ertingen, both of Fed. Rep. of Germany, assignors to Alwin Welsch Polstermöbelfabrik KG, Ebersdorf and Erpo Möbelerke W. Blauw GmbH & Co., Ertingen, both of, Fed. Rep. of Germany

Filed Apr. 3, 1984, Ser. No. 596,280
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1983, 3312371
Int. Cl.[4] A47C 17/13, 17/17
U.S. Cl. 5—47 10 Claims



1. Furniture, particularly upholstered furniture, for transferring a person from a sitting position to a lying position and vice versa, comprising: a seating member that can be extracted forward out of a stationary means and forms part of a reclining surface; said seating member comprising a chassis with rolling support means, a seating frame positioned on top of said chassis and forming a covering and a backrest having two backrest members connected so that they can be swung in relation to each other and positioned substantially back-to-back in a sitting position and being positioned one after the other in a reclining position with said seating members extracted; a bottom framework; one of said backrest members being a rear backrest member hinged to said bottom framework; catch linkages on both sides of said seating frame and arranged to catch in one direction of swing; the other one of said backrest members being a front backrest member connected to said seating frame by said catch linkages; said seating frame being pivotally connected to said chassis; scissoring linkage means on both sides of said backrest and comprising a symmetrical double parallelogram connecting said two backrest members; a four-bar linkage connecting said seating frame to said chassis and having pairs of pivoting elements.

4,601,075

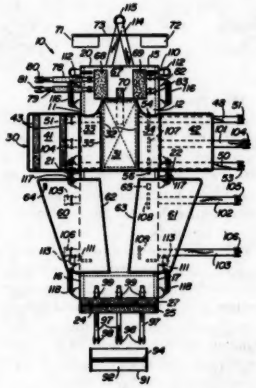
EMERGENCY STRETCHER

J. Rudy Smith, 1239 Ridge Ave., Philadelphia, Pa. 19123

Continuation-in-part of Ser. No. 574,040, Jan. 26, 1984, abandoned. This application May 7, 1985, Ser. No. 731,298
Int. Cl.[4] A61G 1/00; A61F 5/01
U.S. Cl. 5—82 R 12 Claims

1. A stretcher comprising an elongate generally rectangular pocket of flexible sheet material having one end closed and the other end open substantially between opposite side edges of said pocket for removably receiving an elongate stiffener of any desired width approximately up to that of said pocket, an openable end closure at said other end of said pocket for removably retaining a stiffener in said pocket, an elongate flexible torso girding part extending transversely across a longitudinally medial region of said pocket, securing means securing said girding part at the crossing region only to a laterally medial portion of said pocket spaced inwardly from the side edges of said pocket with said girding part free from said pocket adjacent to the pocket edges for wrapping closely about the torso of a person on the exterior of said pocket substantially independently of a stiffener, a pair of rigidifying

parts carried by and rigidifying said girding part respectively extending outwardly from opposite sides of said securing means for furnishing underarm support to a person on said pocket, first elongate flexible strap means extending transversely across a longitudinally medial region of said pocket and secured to opposite pocket edges for wrapping with said pocket and girding part closely about the torso of a person on said pocket when there is no stiffener or a relatively narrow stiffener in said pocket, said first strap means combining with said girding part to hold a stiffener of less than maximum width



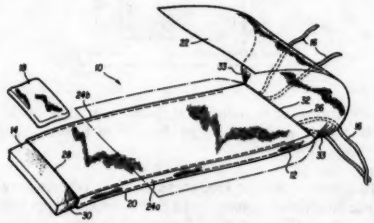
firmly toward the wrapped torso, and second elongate flexible strap means extending transversely across a longitudinally medial region of said pocket and secured to said pocket laterally medially of said pocket spaced inwardly from the side edges of said pocket with said strap means free from said pocket adjacent to the pocket edges for wrapping with said girding part closely about the torso of a person substantially independently of a stiffener in said pocket, said second strap means holding a wrapped person laterally medially of said pocket when a stiffener of up to maximum width is located in said pocket.

4,601,076

LOUNGING/SLEEPING APPARATUS

Marcia L. Knobeloch, P.O. Box 10069, Alexandria, Va. 22310

Filed Nov. 28, 1984, Ser. No. 675,788
Int. Cl.[4] A47G *9/08*
U.S. Cl. 5—413 **8 Claims**



1. A portable lounging apparatus comprising: a single, integral, thin rectangular sheet of resilient foam material having a sufficient firmness that when it is spread out it provides a comfortable support on a floor for a human body lying thereon, said integral resilient foam material sheet being sufficiently resilient that it can be easily folded into a roll for carrying and handling, being sufficiently flexible that it is not damaged by repeated folding and unfolding thereof, being sufficiently strong that the previously mentioned activities do not cause disintegration of it over a long period of use and being of such a size as to hold a human body thereon;

a cloth container having a size and shape approximately the same as that of said single, integral, thin rectangular sheet of resilient foam material for snugly enclosing said sheet of resilient material therein, said cloth container having a foot-end edge, a head-end edge, and two side edges, one of said head-end edge or a side edge of said cloth container having an opening therein through which said sheet of resilient foam material can be selectively inserted into said cloth container and removed therefrom, said cloth container including a closure means for selectively opening and closing said opening, the foot-end edge of said cloth container and the other of said side and head edges being permanently closed, said cloth container being constructed of a durable cloth material; and,

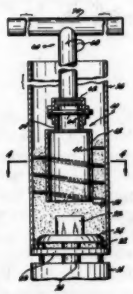
a rectangularly-shaped cloth cover sheet having a foot-end edge and a head-end edge, said cover sheet being substantially wider than the fully-extended width of said cloth container, the foot-end edge of said cover sheet however being permanently sewn by a seam to the foot end edge of said cloth container with the sides of said cover sheet extending substantially laterally beyond the side edges of said cloth container but not being attached to said side edges, the foot-end edge of said cover sheet being gathered to make the size of the foot-end edge of said cover sheet approximately match that of the fully-extended foot-end edge of said cloth container said gathered portions being permanently sewn by said seam to the foot end edge of the cloth container along with the rest of said foot-end edge of said cover sheet, the two side edges of said cloth container remaining substantially unattached to any sheets, said cover sheet being constructed of softer material than the cloth container and having a length for substantially covering a person lying on said cloth container.

4,601,077

TOOL FOR PROVIDING ACCESS TO UNDERGROUND VALVE STEMS

John T. Doty, 2238 E. 21st St., Long Beach, Calif. 90806

Filed Apr. 12, 1985, Ser. No. 722,360
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—138 **4 Claims**



1. As an article of manufacture, a tool constructed for gaining access to a valve operating stem having an operating fitting at the end of an underground valve having a circular enclosure surrounding the operating end of the valve stem and extending to the surface, the tool being in the form of a cylinder having a bore of a size to be received over the operating fitting at the operating end of the valve stem, a helical rib for providing an auger formed on the outside of the said cylinder and of a size to fit within the enclosure, the tool having a fitting at one end

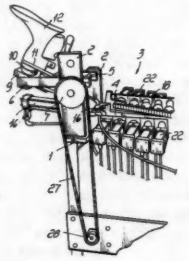
to receive a corresponding fitting at the end of an operating member, the said helical rib having the capability, when rotated, to cut into debris within the enclosure whereby to remove the debris so that access can be had to the operating fitting at the end of the valve operating stem.

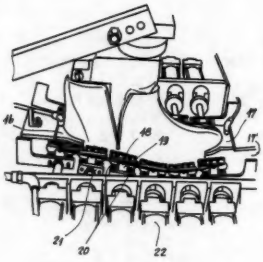
4,601,078

MACHINE FOR ASSEMBLING BOX SOLE FOOTWEAR SEMIAUTOMATICALLY

Costantino Bertolaja, Via Fratelli Cagnoni, 3, 27029 - Vigevano (Pavia), Italy

Filed Apr. 19, 1984, Ser. No. 602,217
Claims priority, application Italy, May 2, 1983, 20892 A/83
Int. Cl.[4] A43D *25/07, 25/00*
U.S. Cl. 12—1 F **2 Claims**





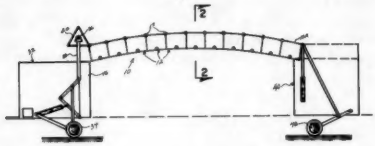
1. A machine for assembling box sole footwear semiautomatically, which comprises a former provided with plural perforations along the side thereof, the former having a base plate, a bed having a pair of uprights, a first horizontal axle being journalled between said uprights and carrying a pair of parallel arms rigidly attached thereto, a sprocket wheel keyed to one end thereof, a second horizontal axle journaled between said parallel arms and supporting a plate provided with at least two electromagnets said electromagnets holding the base plate of said former, a suction pump in communication with said perforations, a rubber plate extending on a horizontal plane and supported by said bed and having members cooperating therewith, said members holding the sole edge pressed against the sides of said former, said members comprising two rubber jaws arranged in an axial direction, driven by respective double-acting cylinders, a plurality of vertical plates arranged lengthwise articulated to a bar and being biased by a pair of springs, each of said bars being mounted in a support driven by a respective double-acting cylinder.

4,601,079

PORTABLE BRIDGING APPARATUS

John A. Corica, 435 W. Elkhorn, Estes Park, Colo. 80517

Filed Sep. 28, 1984, Ser. No. 655,514
Int. Cl.[4] E01D *15/12*
U.S. Cl. 14—2.4 **14 Claims**



1. Portable bridge apparatus comprising;

(a) a plurality of bridge segments which are pivotably connected to one another; wherein each said segment includes a floor portion and spaced apart wall portions; wherein said segments are pivotably connected to one another at the tops of said wall portions; and wherein the length of said segment is shorter at said floor portion than at said tops of said wall portions;

(b) extension and retraction means comprising a rotatable reel adapted to support said bridge segments;

(c) elevation means carried by said base member;

(d) a base member adapted to carry said extension and retraction means and said elevation means;

(e) tensioning means, carried by said base member, which is adapted to maintain said bridge segments in rigid arched alignment when in extended position;

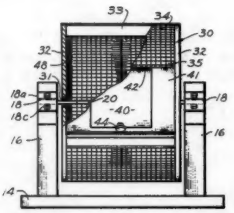
wherein said extension and retraction means is adapted to extend said bridge segments outward from said base in a manner such that an arched bridge is formed; wherein said elevation means is adapted to retract said bridge segments.

4,601,080

WASHING APPARATUS

Terrence E. Cook, NW. 440 North St., Pullman, Wash. 99163

Filed Apr. 29, 1985, Ser. No. 728,574
Int. Cl.[4] A23N *12/00*
U.S. Cl. 15—3.12 **15 Claims**



1. An apparatus for tumbling and cleaning articles useful in combination with an externally applied jet of liquid directed thereat, comprising;

a frame;

a container mounted for free rotation upon said frame and having an interior volume, said container having perimetric surfaces with a plurality of openings therein at perimetric locations about the container through which the jet of liquid reaches articles contained therein and through which soil, debris and liquid leave the container; and container further having closable access means for allowing articles to be placed into and removed from the interior volume of the container;

fin means attached to the container adjacent circumferential surfaces thereof for being impinged upon by the jet of liquid to thereby rotate the container; and

brushing means mounted within the interior volume of said container for contacting and brushing articles being cleaned as the articles tumble within the container as the container is rotated.

4,601,081

DISPOSABLE UTENSIL FOR CLEANING AND DISINFECTING TOILET SEATS AND OTHER ARTICLES

Raymond K. Sutton, and Reba A. Kelly, both of 2738 N. Talbott Ave., Indianapolis, Ind. 46205

Filed Oct. 3, 1984, Ser. No. 657,175
Int. Cl.[4] A47L *13/17*
U.S. Cl. 15—104.94 **12 Claims**

1. A disposable utensil for cleaning toilet seats and other articles, said utensil comprising:

a handle;

first and second pad means, said first pad means being impregnated with a cleaning liquid for cleaning a toilet seat or other article, and said second pad means being substantially dry for drying said toilet seat or other article after being cleaned by said first pad means;

securing means for attaching said first and second pad means to said handle in a substantially permanent manner; and

removable covering means for encasing at least said first pad means in an air-tight manner for maintaining said first pad means moist and ready for substantially immediate use when needed.

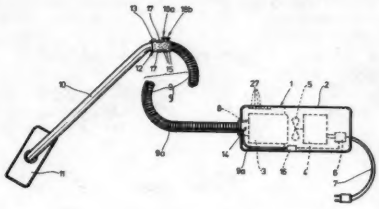
4,601,082

VACUUM CLEANER

Gerhard Kurz, Industriestrasse, 7262 Althengstett, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,579
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404281; Aug. 24, 1984, 3431164
Int. Cl.[4] A47L *9/28*
U.S. Cl. 15—319 **15 Claims**

1. A vacuum cleaner for use in industry and household comprising a housing and an electric motor driving a blower that generates the working vacuum, a suction nozzle for picking up dust and dirt, and maneuvering means connected between the suction nozzle and the housing and having a suction channel therein to permit passage of the material to be cleaned from the suction nozzle to the housing, characterized in that an optical sensor comprising a light transmitter and a light receiver is provided in the suction channel which is traversed by the solid particles, dusts, threads, and the like drawn in during the cleaning operation so that, depending on the quantity of materials drawn in, the light transmission characteristics between said transmitter and said receiver changes, indicating means for indicating the level of material traversing said suction channel, and electronic switching means connected between said sensor and said indicating means andmovable from



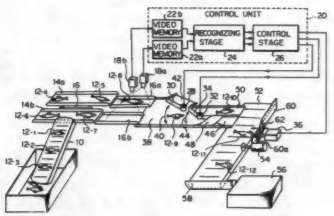
a first to a second state for energizing said indicating means when the level of material in said suction channel reaches a preselected level.

4,601,083

FISH PROCESSING APPARATUS

Toyoshige Shoji, and Tatsuo Miyakawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1983, Ser. No. 564,712
Claims priority, application Japan, Dec. 28, 1982, 57-229480
Int. Cl.[4] A22C *25/14*
U.S. Cl. 17—54 **16 Claims**



1. A fish processing apparatus having head cutter means for cutting off a head portion of a fish, comprising:

means for optically scanning of the whole body of the fish;

means, operatively connected to said optical scanning means, for producing image information of the fish in accordance with said optical scanning;

means, operatively connected to said image producing means, for determining a cutting position of the head portion of the fish in accordance with a shape of the fish represented by said image information, and

means, operatively connected to said determining means, for adjusting the relative position of the fish with respect to said head cutter means in accordance with said determined cutting position.

4,601,084

MEANS FOR ADJUSTING AN EXTRACTOR FOR COTTON STRIPPER

Hurston B. Akin, Rte. 1, Davidson, Okla. 73530

Filed Jun. 13, 1985, Ser. No. 744,158
Int. Cl.[4] D01G *1/00*
U.S. Cl. 19—202 **13 Claims**

1. An extractor unit for removing trash from cotton lint, said extractor comprising:

a housing having two opposed side walls;

at least one drum mounted for rotation within said housing between the insides of said opposed side walls and having saw-like teeth thereon;

a grid plate assembly positioned in front of and spaced from

said teeth on said drum and adapted to contact and separate said trash from said cotton lint as said cotton lint and said trash passes through the clearance between said grid plate assembly and said drum; said grid plate assembly comprises:

a pair of end plates; and

a plurality of parallel rods connecting said end plates together; and

means for accurately adjusting said clearance between said grid plate assembly and said drum and locking said grid

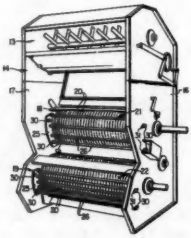


plate assembly at said clearance, said adjusting means being mounted on the outside of said side walls and fully operable from the outside of said housing without requiring access to the inside of said housing;

said adjusting means comprising:

a plurality of adjustment assemblies, a separate adjustment assembly being mounted on the outside of each of said side walls and positioned to cooperate with respective said end plates of said grid plate assembly for moving said grid plate assembly towards or away from said drum and for locking said grid plate assembly at said clearance.

4,601,085

WATER-RESISTANT SLIDE FASTENER STRINGER

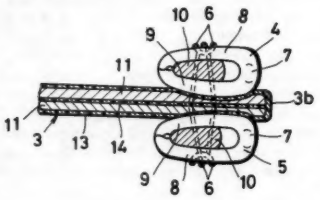
Hiroshi Yoshida, and Yoshitoki Tsubokawa, both of Kurobe, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,344

Claims priority, application Japan, Dec. 15, 1982, 57-219562; Dec. 17, 1982, 57-222676

Int. Cl.[4] A44B *19/40*

U.S. Cl. 24—384 **8 Claims**



1. A water-resistant slide fastener stringer comprising:

(a) a water-resistant support tape having a longitudinal marginal portion having a contact edge adapted to engage a corresponding contact edge of a like companion stringer's support tape to effect a water-tightness between such two stringers, said support tape comprising a core web of a strip of cloth and a layer of water-resistant material covering the whole surface of said core web, said cloth strip being folded on itself into a pair of superposed strip halves;

(b) a film of thermoplastic synthetic resin sandwiched between the opposed cloth strip halves and attached at opposite surfaces to confronting surfaces of the opposed cloth strip halves, respectively;

(c) a pair of rows of coupling elements mounted on opposite surfaces of said support tape along said marginal portion, said pair of rows of coupling elements being engageable with a pair of rows of coupling elements, respectively, of the companion stringer across an intermediate line of mutual engagement; and

(d) said contact edge of said support tape, in its free form, projecting transversely beyond said intermediate line when the opposed coupling element rows of the two stringers are out of mutual engagement.

4,601,086

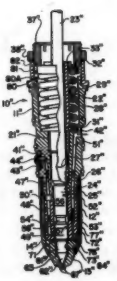
METHOD OF MANUFACTURING TOP STOP-TYPE FUEL INJECTOR

Fritz L. Gerlach, Charlotte, N.C., assignor to Cummins Atlantic, Inc., Charlotte, N.C.

Filed Oct. 15, 1984, Ser. No. 661,249

Int. Cl.[4] B23P *13/00;* **B21K** *1/20, 21/16;* **F02M** *47/02*

U.S. Cl. 29—156.4 R **1 Claim**



1. A method of manufacturing a top stop fuel injector for an internal combustion engine from a pressure-time-delivery fuel injector of the type having a pressure-time-delivery injector body which includes an annular shoulder for seating the injector against the engine head, a barrel and cup positioned in end-to-end relation, a retainer extending around the barrel and securing the barrel and cup to the injector body, a plunger bore defined by inner walls of the injector body, barrel, and cup, a plunger positioned for restrictive movement within said bore for generation injection pressure within said injector from a relatively low delivery pressure and a return spring mounted within the upper end of the injector body remote from the cup in concentric relation to the plunger, the method comprising the steps of:

(a) reducing the length of the injector body above the shoulder;

(b) forming external threads on the remaining upper end of the injector body above the shoulder adjacent the free end thereof;

(c) mounting a collar, having mating internal threads, on the upper end of the injector body; and

(d) threadingly mounting a top stop within said collar for adjustable positioning relative to said return spring and plunger to arrest the plunger at a predetermined upper extent of travel.

4,601,087

METHOD FOR CLADDING INTERIOR SURFACES WITH EXTERNALLY PREFABRICATED CLADDING MATERIAL

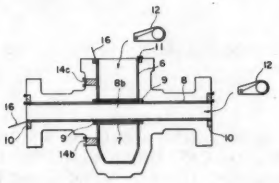
Nobuyasu Kawai, Kobe; Kunihiko Tsuji, Sioya Kitamachi, and Kohichi Beppu, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 10, 1984, Ser. No. 629,513

Claims priority, application Japan, Jul. 15, 1983, 58-128767

Int. Cl.⁴ B21D *53/00, 39/06;* **F16K** *27/00;* **B23K** *20/14*

U.S. Cl. 29—157.1 R **7 Claims**



1. A method for cladding a corrosion resistant high alloy material on surfaces of crossed cavities in a vessel of a high strength metallic material, which comprises:

prefabricating first and second cladding structures of generally tubular shapes conforming with the crossed cavities from a thin sheet of a high alloy material.

providing interior and exterior grooves on the surfaces of said cavities;

positioning corner members of a high alloy material in said interior grooves so as to be located at joint corners of said first and second cladding structures at an intersection of said crossed cavities;

positioning end members of a high alloy material in said exterior grooves so as to be fitted on end portions of said cladding structures;

assembling said first and second cladding structures, corner members and end members into said crossed cavities;

sealing contacting surfaces of the assembled parts by welding said end members to said vessel and cladding structures;

evacuating the contacting surfaces of said vessel, first and second cladding members, corner members and end members after sealing;

applying a high pressure to said cladding structures at a predetermined temperature so as to interconnect the assembled parts and the vessel; and

removing overlapped portions of the cladding structures at the intersection of said crossed cavities to communicate the latter with each other.

4,601,088

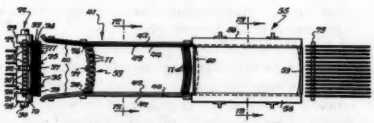
METHOD OF ASSEMBLING A PLATE-FIN HEAT EXCHANGER

John F. Kopczynski, 1671 Sweeney St., North Tonawanda, N.Y. 14120

Filed May 25, 1984, Ser. No. 614,299

Int. Cl.⁴ B21D *53/02;* **B23P** *15/26, 19/04;* **B65H** *1/02*

U.S. Cl. 29—157.3 R **10 Claims**



1. A method of assembling a plate-fin heat exchanger comprising the steps of providing a plurality of like substantially straight elongate plate fins with spaced holes therein, bowing said plate-fins to increase their stability and accumulating a plurality of said plate fins in a stacked contiguous relationship to provide a bundle, providing a plurality of elongated substantially parallel tubes spaced from each other substantially the same distance as said spaced holes and oriented substantially perpendicularly to said stacked plate fins, and mounting said plurality of plate fins in said stacked contiguous relationship onto said plurality of elongated substantially parallel tubes by inserting said substantially parallel tubes into said spaced holes, transferring said bundle of bowed plate-fins to a carriage, and transferring said bundle of plate-fins from said carriage onto said plurality of elongated substantially parallel tubes.

4,601,089

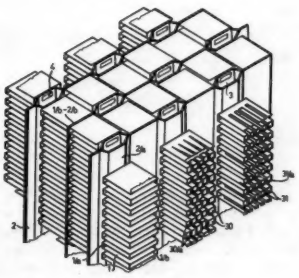
PROCESS FOR THE MANUFACTURE OF HEAT-EXCHANGER ELEMENTS OF STRIP-FINNED HEAT-EXCHANGERS

Pál Gál, 12, Fadrusz u., Budapest XI., Hungary

Continuation of Ser. No. 543,802, Oct. 21, 1983, abandoned, which is a continuation of Ser. No. 341,016, Jan. 20, 1982, abandoned, which is a continuation of Ser. No. 135,358, Mar. 31, 1980, abandoned. This application Dec. 31, 1984, Ser. No. 688,261

Int. Cl.⁴ B21D *53/00, 53/02;* **B23P** *15/26*

U.S. Cl. 29—157.3 V **1 Claim**



1. A process for making a heat exchanger of aluminum, comprising:

applying a pattern of stop weld material to a first plate element;

superimposing a second element on the first plate element and hot-rolling the plate elements together to form a plate;

expanding the sides of the plate that are protected by the stop weld material by the application of fluid pressure to form a plurality of tubular heat exchanger medium flow passages;

securing a plurality of fins by direct weld, without the use of foreign materials, at only one of their ends to the plate;

holding a plurality of the plates in a frame; and

securing the other end of each fin to the other part of a plate by applying additional fluid pressure with the tubular passages of sufficient magnitude to cause permanent deformation and metal-to-metal cohesive bonding between the other end and the surface of the plate.

4,601,090

LEAKPROOF JOINT CONSTRUCTION AND APPARATUS FOR MAKING THE SAME

James C. Gunter, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

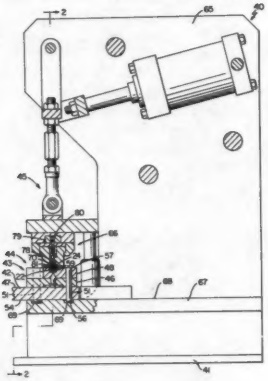
Division of Ser. No. 410,438, Aug. 23, 1982, Pat. No. 4,531,279. This application May 20, 1985, Ser. No. 736,126

Int. Cl.⁴ B21D *39/00;* **B23P** *11/00*

U.S. Cl. 29—243.5 **2 Claims**

1. In an apparatus for making a leakproof joint construction for a pair of members disposed in abutting relation and having

a substantially rectangular part of one of said members deformed into an adjacent substantially rectangular part of the other of said members so that said parts of said members are disposed completely beyond the plane of the outer surface of said other member while respectively being integrally interconnected to the remainder of said members by substantially straight sided tubular portions of said members, said parts being interlocked together by an outward staking of one pair of opposed sides of said tubular portion of said part of said one member into said tubular portion of said other member by a compaction of said parts, the improvement wherein said apparatus has means for so deforming and that causes said one pair of opposed sides of said one member and a corresponding one pair of opposed sides of said tubular portion of said other



member to each be initially disposed at an acute angle relative to said plane of said other member and the other pair of opposed sides of said one member and the corresponding other pair of opposed sides of said tubular portion of said other member to each be substantially at a right angle relative to said plane of said other member and means for so staking and that causes said one pair of opposed sides of said one member and said corresponding one pair of opposed sides of said other member to each toggle over center so as to be disposed at an obtuse angle relative to said plane of said other member while said other pair of opposed sides of said one member and said corresponding other pair of opposed sides of said other member each remain substantially at said right angle to said plane of said other member.

4,601,091

METHOD OF AND APPARATUS FOR THE HEIGHT ADJUSTMENT AND INSTALLATION OF A SLIDING AND/OR RAISABLE ROOF MEMBER TO BE FITTED INTO AN AUTOMOBILE

Rainer Grimm, Wetzlar, and Horst Böhm, Frankfurt, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H, Fed. Rep. of Germany

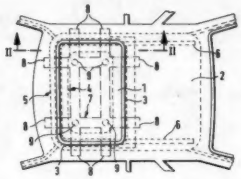
Filed Jul. 8, 1985, Ser. No. 752,708

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 3435813

Int. Cl.[4] B23P *17/00;* **B23Q** *3/00;* **B60J** *7/05, 7/053*

U.S. Cl. 29—423 **14 Claims**

1. A method for the installation and height adjustment of a slidable and/or raisable, rigid roof member in a roof opening of an automobile roof, the method including the steps of first moving actuating elements of the roof construction into a roof-member-closed position, inserting the roof member into the roof opening in a defined position by means of a template engaging over the roof opening and positioned on the automobile roof while pressing a front edge of the roof member onto an adjacent roof opening edge and simultaneously adjusting the height of the roof member relatively to the roof, and thereafter securing the roof member in this installed position at a plurality of locations.



4,601,092

METHOD OF FIXING A RAIL ON A SUPPORT OF TIMBER OR CAST OR MOULDED MATERIAL

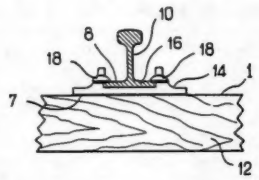
Francois P. Guitaut, Ville d'Avray, and Claude M. Cazenave, Fourqueux, both of France, assignors to Sateba International S.A., Paris, France

Continuation of Ser. No. 423,106, Sep. 24, 1982, abandoned. This application May 14, 1985, Ser. No. 733,735

Claims priority, application France, Sep. 21, 1982, 8215868

Int. Cl.[4] B23P *19/04;* **F16B** *13/04, 37/16*

U.S. Cl. 29—456 **44 Claims**



1. A method for attaching a rail on an upper, substantially planar surface of a timber support by means of at least one fastener and a tie plate, wherein said fastener is adapted to be screwed into said support along a predetermined screwing axis, said fastener comprising a shank having a predetermined radius and extending around a longitudinal axis coincident with said screwing axis wherein said shank comprises a helical thread having a section comprising two sides that are sloped with respect to said longitudinal axis of said shank, wherein said section has a predetermined maximum radius with respect to said longitudinal axis, said fastener further comprising a head, said head adapted to rest on the bottom of a flange of said rail, and wherein said tie plate comprises at least one hole, an upper surface, and a substantially planar lower surface adapted to rest flatly on said upper surface of said support, wherein said at least one hole passes through said tie plate from said lower surface to said upper surface, said method comprising the steps of:

(a) forming a borehole in said upper surface of said support about said screwing axis wherein said borehole has an inner radius substantially equal to said predetermined radius of said shank of said fastener, wherein said borehole further comprises a periphery;

(b) forming a helical tapping in said periphery of said borehole wherein said tapping comprising a thread comprising a section, wherein the pitch of said thread of said helical tapping substantially corresponds to said pitch of said thread of said fastener, and wherein said section of said tapping comprises an upper portion and a lower portion, wherein said upper portion is substantially rectangular and defined by first and second ends substantially parallel to said screwing axis, wherein said second end is furthest

from said screwing axis, wherein said lower portion is contiguous with said upper portion and comprises a first portion and a second portion, wherein said first portion is substantially rectilinear and parallel to said screwing axis, wherein said first portion is spaced from said screwing axis by a distance intermediate between said maximum radius of said thread of said fastener and said second end of said upper portion of the tapping, and wherein said second portion of said lower portion has a configuration permitting the placement of said section of said thread of said fastener in said lower portion of said helical tapping;

(c) screwing an elastic helical metal insert in said helical tapping wherein said metal insert comprises a flat metal strip having a cross-section that is substantially rectangular, wherein said helical metal insert is adapted to be placed in a stressed and an unstressed, rest condition, wherein the pitch of said helical metal insert substantially corresponds to said pitch of said thread of said fastener, wherein said insert comprises a substantially rectangular section having a height substantially equal to the height of said upper portion of said helical tapping, and having a length greater than the distance between the periphery of said shank and said first portion of said lower portion of said tapping and having a length less than the distance between the periphery of said shank and said second end of said upper portion of said tapping, wherein said method further comprises the step of positioning said helical metal insert in said upper portion of said section of said thread of said helical tapping so that said insert is spaced in the radial direction from said second end of said upper portion of said thread of said tapping so as to produce radial play between said helical metal insert and said upper portion, and so that said insert contacts said sloped side of said fastener when said fastener is screwed in said borehole;

(d) positioning said lower surface of said tie plate flatly against said upper surface of said support so that said screwing axis passes through said hole in said tie plate;

(e) placing said flange of said rail on said upper surface of said tie plate;

(f) passing said shank of said fastener through said hole in said tie plate;

(g) screwing said fastener in said borehole of said support by engaging said thread of said fastener immediately below said helical metal insert in said lower portion of said thread of said helical tapping until said head of said fastener is pressing on said flange of said rail, said flange is pressing against said lower surface of said tie plate, said tie plate rests on said support, and said sloped portion of said fastener presses against said insert; and

(h) continuing the screwing of said fastener in a limited manner, wherein said continued screwing of said fastener elastically radially expands said helical metal insert to an extent less than or at most equal to said radial play, and compresses said timber of said support between said helical metal insert and said lower surface of said tie plate in a direction parallel to said screwing axis without applying radial forces to said timber of said support.

4,601,093

WIRE INSULATION STRIPPING APPARATUS

Richard L. Cope, Glendora, Calif., assignor to Eubanks Engineering Co., Monrovia, Calif.

Filed Sep. 21, 1984, Ser. No. 652,958

Int. Cl.[4] H02G 1/12

U.S. Cl. 29—564.4 **15 Claims**

1. Wire stripping apparatus for stripping insulation off a wire core, comprising:

(a) a guide forming at least one opening to receive an insulated wire end,

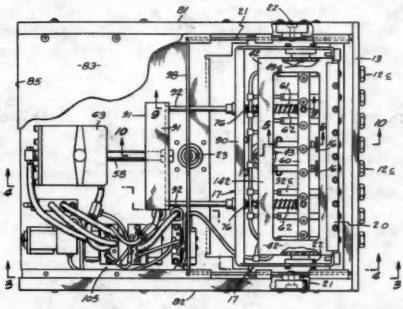
(b) wire end sensor means for sensing a wire end inserted through said opening,

(c) wire end clamping means operable in response to said sensing to clamp said insulated wire inserted through said opening,

(d) cutter means operable in response to said sensing to sever a predetermined length of insulation on said insulated wire end inserted through said opening,

(e) and carriage structure carrying said sensor means and said cutter means to retract same relatively away from said clamp means after said clamp means has clamped said wire end and after said cutter means has severed said insulation, thereby to pull said selected length of insulation off the wire core,

(f) a housing for said apparatus, the housing having a front panel, there being multiple of said guides carried by said front panel and forming different size bore to receive different diameter wires, there being one each of said sensor means, clamping means, and cutter means associated with each of the guides,



(g) said carriage structure carrying all of said sensor means and cutter means to retract them simultaneously relatively away from the clamp means and guides,

(h) each of said clamp means including fixed and movable clamp members, and including additional structure carrying all of said movable clamp members for simultaneous movement of the movable members relatively toward and away from the fixed members, said additional structure including a bar carrying said movable clamp members, pivoted arms carrying said bar, and a clamp actuator on the frame and operatively connected to said pivoted arms,

(i) and wherein said cutter means include multiple relatively fixed and movable blades, and including elongated relatively fixed and movable bars to which the blades are individually and removably connected, the movable blades carried by the movable bar and the fixed blades carried by the fixed bar, the blades having different size cutting edges corresponding to different wire insulation sizes.

4,601,094

TURNING MACHINE WITH AN AUTOMATIC TOOL CHANGER

Carl J. Myers, Mentor, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Apr. 27, 1984, Ser. No. 604,700

Int. Cl.[4] B23Q 3/16

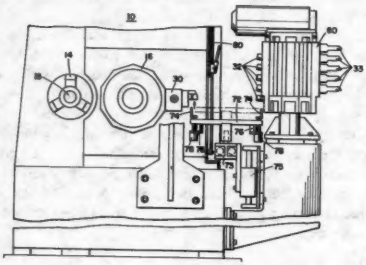
U.S. Cl. 29—568 **12 Claims**

1. A machine tool having a tool turret for supporting a tool, storage means for storing a plurality of tools and a tool changer comprising:

an elongated cross arm having a longitudinal axis and a central axis perpendicular to said longitudinal axis, said cross arm supported intermediate its ends for rotation about its central axis;

a pair of gripping fingers disposed at each end of said cross

arm, each pair of fingers extending parallel to a central axis that is parallel to the central axis of the cross arm; and



means for rotating each pair of gripping fingers around its central axis.

4,601,095

PROCESS FOR FABRICATING A SCHOTTKY-BARRIER GATE FIELD EFFECT TRANSISTOR

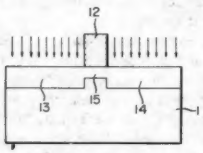
Kenichi Kikuchi; Michitomo Iiyama; Toshiki Ebata, and Hideki Hayashi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

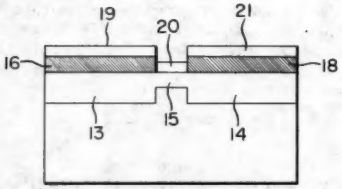
Filed Mar. 23, 1982, Ser. No. 361,070

Claims priority, application Japan, Oct. 27, 1981, 56-172502; Oct. 27, 1981, 56-172503; Nov. 5, 1981, 56-178193; Nov. 6, 1981, 56-178535; Nov. 9, 1981, 56-180052

Int. Cl.[4] H07L *21/263, 21/26*

U.S. Cl. 29—571 **19 Claims**





1. A process for fabricating a Schottky-barrier gate field effect transistor comprising the steps of: forming a first active layer of one electrically conductive type semiconductor crystal with a thickness and carrier concentration chosen so as to give a predetermined pinch-off voltage, forming a stripe-like resist pattern thereon, introducing an impurity for giving the same electrically conductive type as the first active layer into the first active layer by ion implantation or thermal diffusion selectively through the pattern as a mask to form a second deeper active layer at the both sides of the first active layer such that said second active layer has a carrier concentration substantially equal to that of said first active layer, forming a reversed pattern rightly to the stripe-like pattern by the lift off method, vapor depositing a Schottky gate metal thereon, forming a Schottky gate electrode positioned correctly on the first active layer by removing the reversed pattern mask and forming a source electrode and drain electrode on the second deeper active layer.

4,601,096

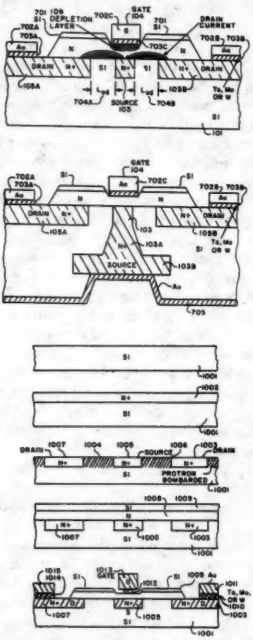
METHOD FOR FABRICATING BURIED CHANNEL FIELD EFFECT TRANSISTOR FOR MICROWAVE AND MILLIMETER FREQUENCIES UTILIZING MOLECULAR BEAM EPITAXY

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 466,662, Feb. 15, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 702,482

Int. Cl.[4] H01L *21/203, 21/302*

U.S. Cl. 29—571 **1 Claim**



1. A process for fabricating a field effect transistor, comprising the steps of:

(a) supplying a semi-insulating crystal wafer having an upper and lower surface, and a right-hand, left-hand and central region on its upper surface,

(b) depositing a thin, amorphous, silicon dioxide layer over the upper surface of the device,

(c) removing the silicon dioxide layer over the right-hand, left-hand and central regions to expose the surface of the semi-insulating crystal in these regions,

(d) depositing by means of molecular beam epitaxy an N+ layer over the upper surface of the device, this deposition forming N+ layers over the exposed crystaline structure in the right-hand, left-hand and central regions and forming a semi-insulating barrier over the amorphous silicon dioxide layer, said barrier surrounding the right-hand, left-hand and central regions,

(e) depositing an N layer over the upper surface of the wafer,

(g) depositing a semi-insulating layer over the N layer,

(h) removing a portion of the semi-insulating layer over the central region to expose the N layer, which forms the gate of the field effect transistor, and

(i) removing a portion of the semi-insulating layer and the N layer over the left and right-hand regions to expose the

N+ layer, which form the drains of the field effect transistor, and

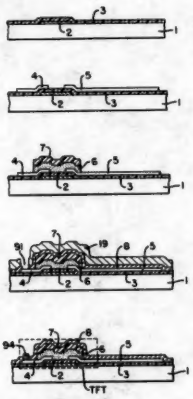
(j) making contact with the N+ layer in the central N+ region, which forms the source for the field effect transistor.

4,601,097

METHOD OF PRODUCING THIN-FILM TRANSISTOR ARRAY

Masafumi Shimbo, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 665,773
Claims priority, application Japan, Nov. 11, 1983, 58-211852
Int. Cl.[4] H01L *29/78*; G02F *1/133*
U.S. Cl. 29—572 7 Claims



1. A method of producing a thin-film transistor array comprising:

a first step of selectively forming gate electrode wirings as row lines made of a first opaque conductive film on an insulating substrate;

a second step of depositing a gate insulator film over said gate electrode wirings and said substrate;

a third step of, after depositing at least a first transparent conductive film, selectively forming source electrode wirings as column lines on said gate insulator film and selectively forming drain electrodes at intersecting portions of said gate and source electrode wirings on said gate insulator film and spaced apart from said source electrode wirings, said source electrode wirings and drain electrodes having overlapping portions relative to said gate electrode wirings;

a fourth step of depositing an amorphous semiconductor thin film on said source electrode wirings, drain electrodes and gate insulator film;

a fifth step of depositing a light-shielding film on said semiconductor thin film;

a sixth step of selectively forming islands of said semiconductor thin film and said light-shielding film in the same shape so that each island has said semiconductor thin film at least in contact with a portion of said source electrode wiring, a portion of said drain electrode and a portion of said gate insulator film which is deposited over a portion of said gate electrode wiring;

a seventh step of forming contact windows in said gate insulator film at least to expose portions of said gate electrode wirings; and

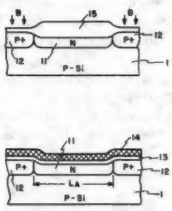
an eighth step of selectively forming at least gate lead-out electrodes of a metal film through said contact windows and source lead-out electrodes of a metal film on portions of said source electrode wirings.

4,601,098

METHOD OF MANUFACTURING PLURAL ACTIVE REGIONS FOLLOWED BY A CHAIN STEP FORMATION

Eiji Oda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,745
Claims priority, application Japan, Nov. 15, 1983, 58-214545
Int. Cl.[4] H01L *21/20, 21/26*
U.S. Cl. 29—578 10 Claims



1. A process for manufacturing a semiconductor device having an active region formed on a semiconductor substrate, the region being defined by a channel stopper, said method comprising the steps of:

forming a first oxide layer by oxidizing a surface of said semiconductor substrate;

forming a nitride layer over said first oxide layer;

forming a second oxide layer having a predetermined thickness on a predetermined portion of said layer where said active region is to be formed, said second layer being formed by removing said nitride layer over said predetermined portion and then oxidizing;

removing said nitride layer;

implanting an impurity forming a channel stopper by using the second oxide layer as a mask;

removing said second oxide layer;

forming a gate oxide layer over said active region by oxidizing; and

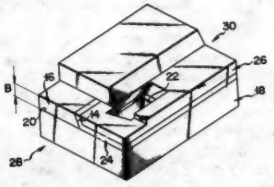
forming an electrode over said gate layer.

4,601,099

METHOD FOR MANUFACTURING A MAGNETIC HEAD

Toyoo Nishiyama, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,252
Claims priority, application Japan, Nov. 22, 1982, 57-205251
Int. Cl.[4] G11B *5/127*
U.S. Cl. 29—603 13 Claims



1. A method for manufacturing a magnetic head, the method comprising the steps of:

forming, from a material block, a first half core having at least two substantially parallel plane surfaces and one lateral surface, wherein a distance between the at least two

substantially parallel plane surfaces is at least equal to a predetermined track width;

fixing a first of the at least two substantially parallel plane surfaces into part of one plane surface of a non-magnetic substrate, so that the one lateral surface meets with the one plane surface of the substrate, wherein said one plane surface has a remaining part onto which said first half core is not fixed;

depositing a magnetic insulator to a substantially uniform thickness onto a second of the at least two substantially parallel plane surfaces onto said one lateral surface, and onto the remaining part of said one plane surface of the substrate, thereby forming a gap spacer film to serve as a gap spacer;

depositing a second material, which is the same as the material from which the first half core is formed, to a substantially uniform thickness to a part of the magnetic insulator that is on the second of the at least two substantially parallel plane surfaces, and depositing said second material onto a part of the magnetic insulator that is on said one lateral surface, thereby forming a second half core having a thickness that is at least equal to the predetermined track width; and

removing, from regions near and along sliding contact surfaces of said first half core and said second half core which contact surfaces are adapted to be in sliding contact with a magnetic recording tape, said part of the magnetic insulator that is on the second of the at least two substantially parallel plane surfaces, and removing, from said regions, that part of the second material that is on said part of the magnetic insulator that is on the second of the at least two substantially parallel plane surfaces, so that the first half core, part of the magnetic insulator that is on the said one lateral surface that part of the second material which is on the part of the magnetic isulator that is on said one lateral surface, and said remaining part of said one plane surface of the substrate constitute a pair of cores for a magnetic head.

4,601,100

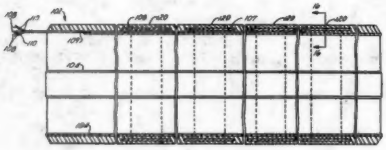
METHOD FOR MAKING LOGGING SLEEVE

Henry S. More, Carmichael, and Christopher E. Koch, Sacramento, both of Calif., assignors to Exploration Logging, Inc., Sacramento, Calif.

Division of Ser. No. 423,003, Sep. 24, 1982, Pat. No. 4,483,393. This application Aug. 20, 1984, Ser. No. 642,404

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—885 **8 Claims**



1. A method for making a logging sleeve adapted to slide on and off a drill string in a well for measuring a downhole characteristic in the well, the method including the steps of:

(a) placing at least one layer of resin-coated fibers in a longitudinal groove in a mandrel;

(b) placing an elongated electrical conductor having an end on the resin-coated fibers in the groove;

(c) placing additional resin-coated fibers on the conductor to substantially fill the groove;

(d) wrapping resin-coated fibers around the mandrel to cover the fibers in the groove;

(e) mounting an electrically conductive annular ring with a longitudinally extending anchor strip on the resin-coated fibers wrapped around the mandrel;

(f) electrically connecting the end of the conductor to the ring;

(g) wrapping additional resin-coated fibers around the mandrel and at least a portion of the strip;

(h) curing the resin to form the sleeve with an inner and longitudinal spline adapted to make a sliding fit in a matching longitudinal groove in the drill string; and

(i) sliding the sleeve off the mandrel.

4,601,101

RAZOR SYSTEM

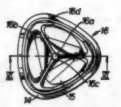
Angus J. McGready, Reading, England, assignor to Wilkinson Sword Limited, High Wycombe, England

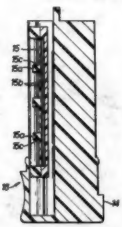
Filed Mar. 5, 1985, Ser. No. 708,304

Claims priority, application United Kingdom, Mar. 14, 1984, 8406683

Int. Cl.[4] B26B *21/24*

U.S. Cl. 30—40.2 **10 Claims**





1. A razor system comprising a blade unit, a razor handle and coupling means on the handle for releasably securing the handle to the blade unit to form an operative razor, the blade unit comprising a blade support and at least one razor blade permanently secured in the blade support, and a dispenser containing a plurality of blade units, the dispenser being removably contained within said handle wherein each blade unit is removable from the dispenser by longitudinal sliding movement, and the coupling means comprise a pair of first pivot members resiliently movable towards and away from each other, the blade unit having a cooperative pair of second pivot members for engagement by said first pivot members to connect the blade unit to the handle for pivotal movement about an axis parallel to the cutting edge of the or each blade.

4,601,102

GUARD FOR SKINNING KNIFE

Robert W. Phillips, Rte. 1, Box 142, Clermont, Fla. 32711

Filed Nov. 23, 1984, Ser. No. 674,496

Int. Cl.[4] B26B *29/00*

U.S. Cl. 30—123.5 **4 Claims**

1. A guard device for knives being used in slitting, evisceration, and skinning of animals comprising:

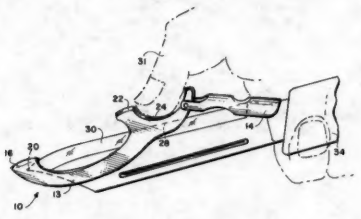
a body having a forward arcuate section and a contiguous arcuate rearward section;

a blunt point at the distal end of said forward section;

a saddle horn portion of said body forming a juncture between said forward section and said rearward section, said forward section having a concave surface between said point and said saddle horn portion, and said rearward section having a concave surface between said saddle horn portion and the rear end of said rearward portion;

said forward section having an elongate longitudinal slot therethrough normal to said concave surface for receiving the sharp edge of a knife blade, said slot narrowing to a wedge shape within said point for receiving the tip of said knife blade, said slot narrowing to an elongate wedge shape adjacent said saddle horn portion for gripping said sharp edge of said knife blade; and

a rear knife edge guard pivotally attached to said rear end of said rearward section, said guard adjustable to cover the



rear portion of the sharp edge of a knife blade and is pivotable forward to engage said body opposite said forward and rearward concave surfaces for stowage of said device;

whereby said knife blade has its tip and a rear portion of its sharp edge guarded by said device exposing only a short forward portion of its sharp edge and in which said concave surface of said rearward section of said device serves as a thumb rest for a user of said device.

4,601,103

CUTTER HAVING CIRCULAR ROTARY BLADE

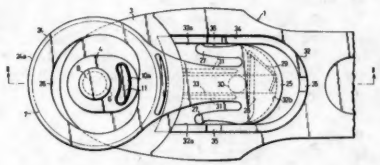
Makoto Sugiyama, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Seki, Japan

Filed Dec. 21, 1984, Ser. No. 684,856

Claims priority, application Japan, Jun. 26, 1984, 59-95813[U]

Int. Cl.⁴ B26B *25/00*

U.S. Cl. 30—162 **7 Claims**



1. A cutter having a circular rotary blade comprising:

(a) a handle;

(b) a blade mounting section formed on one end of said handle;

(c) a circular blade secured to one side of said blade mounting section and rotatably carried at its central portion;

(d) a hole having an opening formed in the blade mounting section at a position behind the central portion of said circular disc and corresponding to said circular blade;

(e) a pressing member movably received in said hole and projectable through the opening of the hole into pressure contact with one side of said circular blade; and

(f) an operation member adapted to limit the movement of said pressing member so as to adjust the pressure of contact between said pressing member and said circular blade, said operation member being held in engagement with said pressing member and positioned on the opposite side of said blade mounting section to said circular blade and further provided with a cam surface formed on the side thereof opposing said circular blade and adapted for engaging a cam surface formed on said pressing member.

4,601,104

HANDHELD PLANER

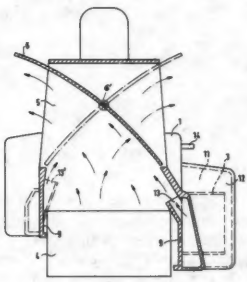
Adolf Zaiser, Koengen; Dieter Raichle, Reudern; Helmut Schwaiger, Unterensingen; Adolf Hermann, Neckartailfingen, and Edgar Bischof, Frickenhausen, all of Fed. Rep. of Germany, assignors to Karl M. Reich Maschinenfabrik Gesellschaft mit beschraenkter Haftung, Nuertingen, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 703,048

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406728

Int. Cl.⁴ B27C *1/10*

U.S. Cl. 30—475 **7 Claims**



1. A portable planer, having a planing head rotatably mounted in a housing and driven through a drive belt by an electric motor also mounted in said housing, comprising a blower connected to a drive shaft of said electric motor for producing a motor cooling air stream, chip ejection channel means in said housing, a connecting channel for communicating said blower and said chip ejection channel means, a branching port in said connecting channel for diverting only a volume portion of said motor cooling air stream into said chip ejection channel means as a chip ejection air stream for keeping chips in a loose state for an efficient chip ejection, said housing having side walls and a chip ejection opening in each housing wall, said chip ejection openings leading out of said chip ejection channel means, a journal axis in said chip ejection channel means, a damper-type deflection flap pivotally mounted on said journal axis in said chip ejection channel means above said planing head for flipping said deflection flap back and forth between two operative positions for guiding chips out of the respective chip ejection opening, said connecting channel comprising at least one air passage (13) in said housing for said chip ejection air stream, said air passage passing at an angle upwards into said chip ejection channel means for direct cooperation with the deflection flap in its operating position.

4,601,105

VEHICLE MEASURING INSTRUMENT

Kichisaburo Yamazaki; Katsunori Yamazaki, and Yoshihiro Yamazaki, all of 3-36, Shinkoyasu 2-chome, Kanagawa-ku Yokohama-shi Kanagawa 221, Japan

PCT No. PCT/JP84/00132, § 371 Date Nov. 13, 1984, § 102(e) Date Nov. 13, 1984, PCT Pub. No. WO84/03938, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 24, 1984, Ser. No. 675,839

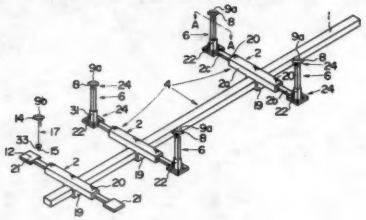
Claims priority, application Japan, Apr. 5, 1983, 58-58735; Oct. 18, 1983, 58-194735

Int. Cl.⁴ G01B *5/25, 5/14*

U.S. Cl. 33—180 AT **24 Claims**

1. A vehicle measuring instrument including a base frame at least longitudinally and transversely extending, three or more suspenders having connectors adapted to be connected to a vehicle at vehicle reference points, said suspenders at least vertically extending and connected to the base frame at three

or more positions not lying in a straight line and thereby suspending the base frame from the vehicle, reference portions provided on said base frame, pendulum members serving to indicate a perpendicularity under an effect of its own gravity, and said pendulum members having reference point corresponding portions to be positioned in conformity with the respective vehicle reference points and opposing portions to be opposed to said reference portions so that the possible deviations of the vehicle reference points from the respective normal positions may be indicated with the above-mentioned arrangement, characterized in that there are provided angle variable portions permitting angles of the respective suspenders with respect to the base frame to vary in longitudinal direction, transverse direction and composite directions of them under an effect of the base frames own weight depending on an inclination of the vehicle.

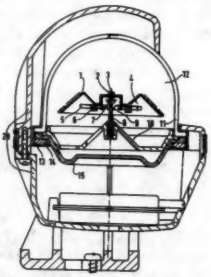


4,601,106

VIBRATION ATTENUATOR

Pertti Leinonen, Espoo, Finland, assignor to Suunto Oy, Finland

Filed Apr. 12, 1985, Ser. No. 722,462
Claims priority, application Finland, Apr. 13, 1984, 84 1490
Int. Cl.[4] G01C *17/08*
U.S. Cl. 33—356 **15 Claims**



1. In a compass, comprising a frame, a compass rose, a bearing for the compass rose, and a bearing support, the improvement comprising

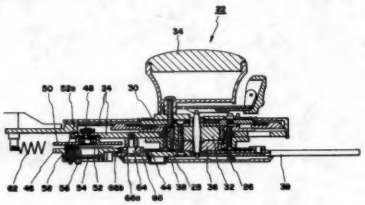
means situated between said bearing support and said frame for resiliently interconnecting the same, for attenuating transfer of vibrations from said frame to said compass rose, for attenuating revolving of said compass rose due to such vibrations, and for attenuating any transfer of impact to said compass rose from surroundings thereabout, said means being resilient in both longitudinal and lateral directions, so that said means have freedom of movement in both the longitudinal and lateral directions.

4,601,107

SCALE BALANCING DEVICE IN UNIVERSAL PARALLEL RULER DEVICE

Yasutomo Yoshida, c/o Mutoh Industry Ltd., 3-I-3, Ikejiri, Setagaya-ku, Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,898
Int. Cl.[4] B43L *13/02*
U.S. Cl. 33—438 **1 Claim**



1. A scale balancing device for use in a universal parallel ruler device having a head, a spindle rotatably supported on a non-rotating part of the head, a scale mounting plate fixed to a lower portion of the spindle, a handle fixed to the upper portion of the spindle, and scales mounted on the scale mounting plate, said scale balancing device comprising:

a first gear coaxially mounted on said spindle for rotation therewith, the weight of the scales exerting a torque on said first gear;

a second gear rotatably mounted on a non-rotating part of said head and having urging means connected thereto for applying a torque to said second gear to rotate said second gear in a predetermined rotating direction; and

a two-stage intermediate gear means having a small diameter gear and a large diameter gear integrally connected and rotatably supported on a non-rotating part of said head, said second gear being in mesh with said small diameter gear and said large diameter gear being in mesh with said first gear, the ratio of the diameter of said first gear to the diameter of said large diameter gear being substantially the same as the ratio of the diameter of said second gear to the diameter of said small diameter gear, and the direction in which the torque is exerted on said first gear due to the weight of the scales being transmitted through said gear means and exerted on said second gear in a direction opposite said predetermined direction and being substantially cancelled out by the torque on said second gear due to said urging means.

4,601,108

SPACER DEVICE

Neubert W. Swanson, Box 510, Moose Lake, Minn. 55767

Filed Oct. 25, 1984, Ser. No. 664,522
Int. Cl.[4] B43L *7/06*; G01C *3/00*
U.S. Cl. 33—454 **2 Claims**

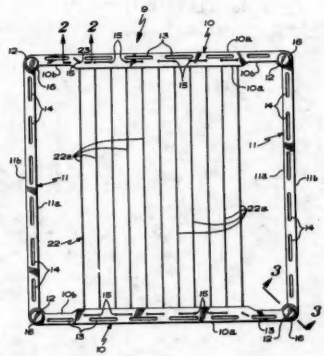
1. A spacer device comprising:

a parallelogramic frame including opposed pairs of elongate frame members, opposite end portions of each frame member being of enlarged circular configuration, said enlarged circular end portions having a thickness dimension approximately one-half of the thickness dimension of the associated frame member, said enlarged circular end portion of one frame member engaging the enlarged circular end portion of the adjacent frame member, one opposed pair of said frame members each including a central portion having a width dimension greater than the width dimension of those portions located between the central portion and the circular end portions,

means pivotally connecting the inter-engaging enlarged circular end portions of adjacent frame members together for relative pivotal movement therebetween,

said one opposed pair of said frame members each having a plurality of longitudinally spaced apart openings in the central portion thereof having the greater width dimension, said openings in each of said frame members lying in a line passing through the centers of the pivot means which pivotally connect each of said frame members to the adjacent frame members,

an elongate flexible filament formed of plastic material and having one end thereof extending through the endmost opening in one of said one opposed pair of frame members and being threaded through said openings to provide a plurality of parallel equally spaced apart spacer elements which are disposed in substantially parallel relation with



each other and the other of said pair of frame members, said filament having its other end projecting through the endmost opening of the other of said one opposed pair of frame members, a pair of plug elements projecting into said endmost openings engaging the respective ends of said filament to anchor the same therein, the spacing between said spacer elements being readily adjusted upon pivoting of the frame members of said parallelogramic frame to shift the latter between a rectangular configuration to a configuration wherein the frame members lie in substantially side-by-side contiguous relationship to thereby permit the device to be used in visually measuring sizes of structural forms.

4,601,109

MEASURING PROCESS FOR THE INSPECTION OF TURNED PARTS FINISHED ON BOTH SIDES THEREOF AND INSTALLATION FOR IMPLEMENTING THE PROCESS

Otto Klingler, Oberndorf-Boll, and Günther Ross, Oberndorf, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

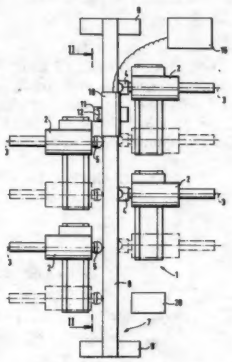
Filed Dec. 18, 1984, Ser. No. 682,680

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1983, 3345936

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—517 **7 Claims**

1. In a measuring process for evaluating the machining capability of a multi-spindle rotary machining unit for the production of rotationally-symmetrical workpieces which are to be finished on both sides, and for the intermediate and final evaluation of workpieces machined in said unit; the improvement comprising: positioning a measuring installation in front of a workpiece pickup device of said rotary machining unit, said measuring installation being independently programmable, multi-dimensionally measuring and autonomously operating relative to the multi-spindle rotary machining unit; measuring in a first step through sensing with feelers of the measuring installation at predetermined reference points the correctly positioned pickup of the workpiece which is clamped into the workpiece pickup device; transmitting a signal input to a control arrangement of the multi-spindle rotary turning unit to decide whether to implement a subsequent rotary machining



sequence; measuring the workpiece in a second step subsequent to implementing the rotary machining; and transmitting a further signal to the control unit to decide whether to implement further processing of the workpiece.

4,601,110

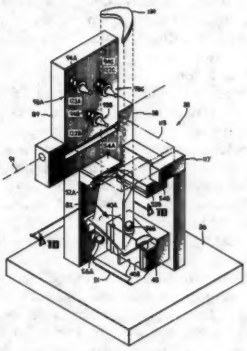
FIXTURE DEVICE

Charles W. Donaldson, Blanchester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 477,272, Mar. 21, 1983, Pat. No. 4,509,265. This application Dec. 21, 1984, Ser. No. 685,106

Int. Cl.[1] G01B *5/20, 11/24*

U.S. Cl. 33—547 **4 Claims**



1. Apparatus for supporting an object at an accurately known position, comprising:

(a) a bracket;

(b) first, second, and third point supports for contacting the object at first, second, and third contact points, the three contact points defining a first plane;

(c) fourth and fifth point supports for contacting the object at fourth and fifth contact points, the fourth and fifth contact points defining a line which is nonperpendicular to the first plane of (b); and

(d) a sixth point support for contacting the object at a sixth contact point, the sixth contact point

(i) being noncoplanar with the plane of (a),
(ii) being noncolinear with the line of (c), and
(iii) defining with the fourth and fifth contact points a second plane which is nonperpendicular with the plane of (b);
the six point supports being located at predetermined positions with respect to the bracket.

4,601,111

GEAR TOOTH TEST FEELER

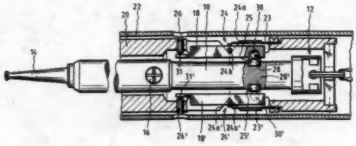
Nikolaus Berchtold, Zurich, Switzerland, assignor to Maag Gear-Wheel & Machine Company, Ltd., Zurich, Switzerland

Filed May 23, 1985, Ser. No. 737,164

Claims priority, application Switzerland, May 28, 1984, 2646/84

Int. Cl.⁴ G01B *3/22*

U.S. Cl. 33—559 **11 Claims**



1. A gear tooth test feeler for a gear tooth testing machine, comprising;
a sensing lever;
said sensing lever defining a plane of deflection and having a first end, a second end, an intermediate region adjacent said second end, a first side, a second side opposite said first side and a neutral position;
a feeler tip mounted on said first end;
a measuring system mounted on said second end;
a carrier member;
first pivot bearing means for deflectably mounting said sensing lever within said carrier member to perform a deflection substantially in said plane of deflection;
said first pivot bearing means being of a construction which generates a counter-force which increases substantially in proportion to said deflection of said sensing lever;
a first rocking lever;
a second rocking lever;
said first rocking lever being arranged on said first side substantially coincident with said plane of deflection and at said intermediate region of said sensing lever;
said second rocking lever being arranged on said second side substantially coincident with said plane of deflection and at said intermediate region of said sensing lever;
each of said first rocking lever and said second rocking lever having an initial position;
second pivot bearing means for said first rocking lever;
third pivot bearing means for said second rocking lever;
a first stop member for said first rocking lever;
a second stop member for said second rocking lever;
said first rocking lever being positioned between said carrier member and said sensing lever by said second pivot bearing means and said first stop member, and said second rocking lever being positioned between said carrier member and said sensing lever by said third pivot bearing means and said second stop member such that said first rocking lever and said second rocking lever maintain said sensing lever in said neutral position and such that when said sensing lever performs said deflection out of said neutral position, said sensing lever selectively either entrains said first rocking lever and leaves said rocking lever in said initial position thereof or entrains said second rocking lever and leaves first rocking lever in said initial position thereof;
a first magnet member;
a second magnet member; and
said first magnet member and said magnet member being selectively both mounted on said sensing lever for exerting a magnetic force of attraction counter to said counter-force upon a respective one of said first rocking lever and said second rocking lever or being individually mounted on respective ones of said first rocking lever and said second rocking lever for exerting said magnetic force of attraction upon said sensing lever.

4,601,112

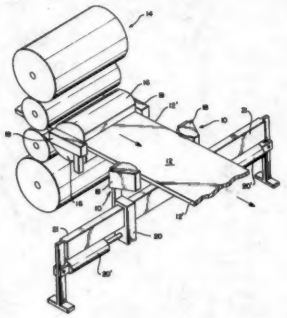
LIQUID EDGEBEAD REMOVAL DEVICE

Donald C. Kush, Pleasanton, and Gary A. Hust, Tracy, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jun. 14, 1985, Ser. No. 744,712

Int. Cl.⁴ F26B *5/12, 5/14*

U.S. Cl. 34—9 **22 Claims**



21. A method for removing residual liquid coolant from the marginal side edges of a moving flat rolled strip of metal as it exits from the discharge end of a rolling mill stand and subsequent to the exposure of the top and bottom surfaces of the moving strip to a dry blow-off gaseous medium and the diversion of liquid coolant therefrom comprising the steps of:
A. simultaneously and continuously contacting each of the two side marginal edges of the strip with a separate roller the axis of which is arranged normal to said top and bottom surfaces of said strip and the strip contacting surface of which is rigid and imperforate to effect full and free rotation of each roller; and
B. while maintaining strip edge and roller contact allowing each of said rollers to separately divert immediately externally of the roller liquid coolant away from the respective side marginal edge of the strip with which a particular roller is associated and toward liquid coolant capture means.

4,601,113

METHOD AND APPARATUS FOR FLUIDIZED STEAM DRYING OF LOW-RANK COALS

Robert Draper, Churchill Boro, and Robert W. Wolfe, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1985, Ser. No. 727,950

Int. Cl.⁴ F26B *3/04*

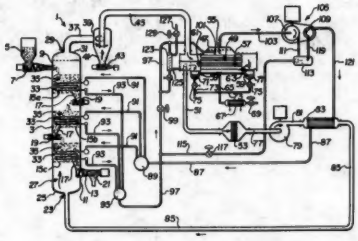
U.S. Cl. 34—10 **20 Claims**

1. An apparatus for drying low-rank coals containing interstitial water, comprising:
a sealed vessel containing means for forming a plurality of successive fluidized beds of solids therein, having means for passing low-rank coal solids thereto at one end and means for removing said low-rank coal solids therefrom at the other end after passage therethrough;
heat exchange tubes extending into said sealed vessel at the location of each of said fluidized beds;

steam injector means at said other end of the sealed vessel for charging steam into said vessel for passage therethrough countercurrent to the flow of low-rank coal solids to fluidize the same in each of said plurality of successive fluidized beds, and remove interstitial water therefrom to form a composite steam flow;

means for exhausting said composite steam flow from said one end of the sealed vessel;

means for partially condensing said composite steam flow, to which said composite steam flow is passed after exhaustion from said vessel, so as to remove a supply of condensed water therefrom substantially equal to the water removed from the low-rank coal in said sealed vessel;



means for heating said steam flow after removal of said condensed water and returning the heated steam to the sealed vessel through said steam injector means;

means for passing a secondary heated fluid through said heat exchange tubes, to effect heat exchange between said fluid and said low-rank coal, whereby the low-rank coal is heated and the fluid cooled and condensed;

means for passing said cooled fluid, after said heat exchange, to said means for partially condensing said composite steam flow to partially condense the same; and

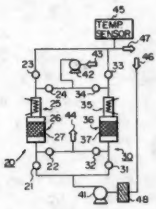
means for compressing said cooled fluid, after passage through the means for partially condensing said composite steam, to heat the same and return the heated fluid to said heat exchange tubes.

4,601,114

METHOD AND APPARATUS FOR DEMOISTURIZING AND HEATING DRYING AIR FOR DRYING SYNTHETIC PLASTIC MATERIAL

Haruo Noguchi, Yokohama, Japan, assignor to Colortronic Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,316
Claims priority, application Japan, Feb. 25, 1984, 59-35002
Int. Cl.[4] F26B *3/04*
U.S. Cl. 34—27 **15 Claims**



1. A method of demoisturizing and heating drying air to be circulated for drying synthetic plastic material held in a supply container, such as a drying hopper, comprising in combination the steps of:

arranging two separated adsorbing treatment means, each means having a moisture adsorbing column filled with adsorbent;

connecting alternatively one of the two separate adsorbing treatment means to the supply container for a first predetermined period of time;

circulating the drying air through said supply container and the moisture adsorbing column of said one of the two separate adsorbing treatment means for said first predetermined period of time, so that the drying air which has demoisturized the synthetic plastic material is subjected to adsorption treatment by said moisture adsorbing column;

passing heated air through the other of the two separate adsorbing treatment means for a second predetermined period of time shorter than said first predetermined period of tiem during the above-mentioned circulating step so as to desorb moisture from the moisture adsorbing column of said other of the two separate adsorbing treatment means;

passing subsequently a part of said drying air, which has passed through said supply container and has demoisturized the synthetic plastic material, through the other of the two separate adsorbing treatment means for a third predetermined period of time prior to completion of the above-mentioned circulating step and after the above-mentioned passing step of the heated air, so that said moisture adsorbing column of said other adsorbing treatment means is cooled by said part of said drying air; and

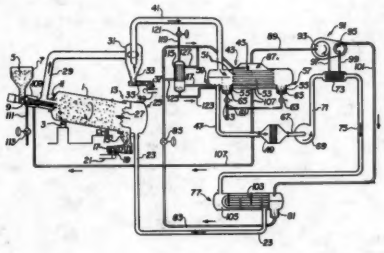
mixing said part of said drying air which has passed through said other adsorbing treatment means with said drying air which has been subjected to adsorption treatment by said moisture adsorbing column of said one of said two separate adsorbing treatment means.

4,601,115

METHOD AND APPARATUS FOR STEAM DRYING OF LOW-RANK COALS USING A ROTARY CYLINDRICAL VESSEL

Robert Draper, Churchill Boro, and Robert W. Wolfe, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1985, Ser. No. 727,948
Int. Cl.[4] F26B *3/04*
U.S. Cl. 34—32 **15 Claims**



1. An apparatus for drying low-rank coal to remove interstitial water therefrom comprising:

a rotary cylindrical vessel containing means for charging low-rank coal to one end thereof, passing the coal therethrough, and means for removing said low-rank coal therefrom at the other end thereof;

steam injector means at said other end for charging steam into the rotary cylindrical vessel for passage therethrough, countercurrent to the flow of low-rank coal, to remove water therefrom to form a composite steam flow;

means for exhausting the composite steam flow from said one end of the rotary cylindrical vessel;

means for partially condensing said composite steam flow, to which said composite steam flow is passed after exhaustion from the rotary cylindrical vessel, so as to remove a

supply of condensed water therefrom substantially equal to the water removed from the low-rank coal in said rotary cylindrical vessel; and

means for heating said steam flow after removal of said condensed water and returning the heated steam to the rotary cylindrical vessel through said steam injector means.

4,601,116

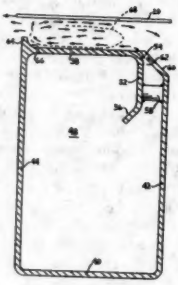
COANDA NOZZLE DRYER

Leonard C. Krimsky, Englewood, N.J., assignor to Worldwide Converting Machinery, Inc., Allendale, N.J.

Filed May 16, 1985, Ser. No. 734,798

Int. Cl.[4] F26B *13/20*

U.S. Cl. 34—156 **6 Claims**



1. A dryer unit for applying a drying gas to a web including in combination means forming a pressure surface adapted to be arranged generally parallel to the web to be dried, means forming a Coanda type nozzle having an opening adjacent to one end of said pressure surface and means forming a curved surface connecting said nozzle opening to said pressure surface, means for supplying said nozzle opening with drying gas to produce a Coanda flow of gas onto and along said pressure surface and means forming a mechanical barrier at the other end of said pressure surface for directing said flow of gas toward said web to produce pad of air between said pressure surface and said web.

4,601,117

RAKE ADJUSTING DEVICE, PARTICULARLY FOR REAR ENTRANCE SKI BOOTS

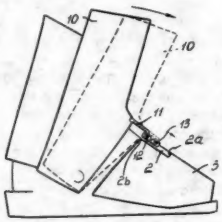
Alfio Leonardi, Rome, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jul. 16, 1984, Ser. No. 631,369

Claims priority, application Italy, Jul. 26, 1983, 22485/83[U]

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—120 **11 Claims**



1. A rake adjusting device particularly for rear entrance ski boots having a shell, and at least one quarter hinged thereto, said rake adjusting device comprising a plurality of engageable elements, engagement means and stop means, said plurality of engageable elements being associated with said shell and adapted for longitudinal displacement movement in a direction extending along a portion thereof, said engagement means being associated with said at least one quarter and selectively releasably engageable with at least one of said plurality of engageable elements, said stop means being adapted for delimiting said longitudinal displacement movement of said plurality of engageable elements.

4,601,118

SKI-BOOT WITH A BOOT LEG HAVING ADJUSTABLE SIDE INCLINATION

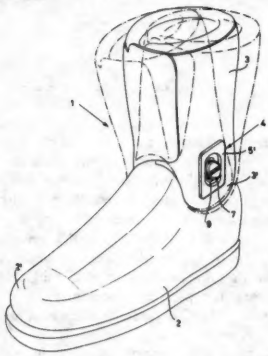
Ruggero Zanatta, Nervesa della Battaglia, Italy, assignor to Calzaturificio Tecnica spa, Nervesa della Battaglia, Italy

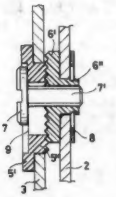
Filed Jul. 5, 1983, Ser. No. 511,028

Claims priority, application Italy, Jul. 19, 1982, 22429/82[U]

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—120 **7 Claims**





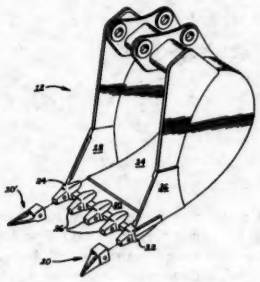
1. Ski boot of the type comprising a foot housing body and a boot leg joined to said body and enclosing the lower portion of a skier's leg, said boot leg being anchored to said body by means permitting fore and aft movement thereof with respect to said body during skiing, comprising adjustable means between the said boot leg and said body permitting horizontal displacement of said boot leg with respect to said body, said means comprising two cooperating blocks having ribbed surfaces, a first of said blocks being fixed to said boot leg and the second of said blocks being rotatably attached to said boot body and thereby permitting said fore and aft movement to occur, said blocks being connected to each other by means of a horizontal pin passing through openings formed in said blocks and vertically slidably housed within a slot formed in a body portion of one of said blocks.

4,601,119

CORNER TOOTH FOR A BUCKET

Gene R. Klett, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 1, 1984, Ser. No. 656,622
Int. Cl.[4] E02F 9/28
U.S. Cl. 37—141 T 17 Claims



1. An earth working tooth adapted for attachment to either end of the leading edge of a bucket, comprising:

an attachment portion adapted for engagement with the bucket to maintain the tooth in a normal working position;

a first plane defined in said tooth along a central longitudinal axis of the attachment portion, said plane being vertically oriented with respect to the normal working position of the tooth;

a ground engaging portion having one and only one substantially flat member spaced from and vertically oriented with the first plane and connected to and extending from the attachment portion and a single reinforcement rib extending perpendicularly from the flat member and being connected to both the flat member and the attachment portion; and

a second plane defined in said tooth along the central axis perpendicular to the first plane, said reinforcement rib being centrally disposed along said second plane and said tooth being symmetrical about the second plane, a cross section of said tooth through said reinforcement rib and normal to said flat member being T-shaped.

4,601,120

FLEXIBLE ILLUMINATED DISPLAY

William J. Levin, 321 E. 13th St., Apt. 14-E, New York, N.Y. 10003

Filed Nov. 9, 1984, Ser. No. 669,776
Int. Cl.[4] G09F 3/00
U.S. Cl. 40—317 8 Claims

1. An arrangement for protecting a user from the elements while simultaneously displaying a message, the arrangement comprising:

depolyable umbrella means having a web member attached to a deployable ribbed frame, whereby when said ribbed frame is deployed, said webbed member is extended thereover;

display substrate means for supporting the message to be displayed, said display substrate means being flexible and having a plurality of apertures therethrough;

second substrate means disposed on said display substrate means and configured in the shape of at least one symbol which forms the message, said second substrate means being flexible and having a plurality of apertures therethrough, said apertures being in registration with said apertures through said display substrate means;

a plurality of illumination members arranged to enter through said apertures in registration through said display substrate means and said second substrate means, respectively, whereby said illumination members are secured therein, and visible at said second substrate means;

flexible conductor means for coupling said illumination members electrically to one another; and

affixation means for joining said display substrate means to said deployable umbrella means selectably in a first position where the message on said display substrate means is to be displayed, and in a second position when the message is desired not to be displayed.

4,601,121

TRIANGULAR GUN SIGHT

Thomas A. Jolly, 352 Loma Vista, El Segundo, Calif. 90245

Filed Oct. 25, 1984, Ser. No. 664,611
Int. Cl.[4] F41G 1/00, 1/32; F21V 9/16
U.S. Cl. 42—100 5 Claims

1. A gun sight for mounting on a gun having a muzzle, barrel and top surface, said sight comprising:

a base portion attached to the top surface of said gun,

a top portion in the form of an elongated isosceles triangle having its apex towards the muzzle of the gun and its base towards the rear of the gun, said top portion rising linearly towards the muzzle of the gun,

said top portion rising a distance substantially equal to the altitude of an equilateral triangle having a side equal in length to that of the base of said isosceles triangle,

whereby when a target is sighted along said top portion of the sight, the gun is properly aimed when an equilateral triangle with its apex centered on the target appears in the sight.

4,601,122

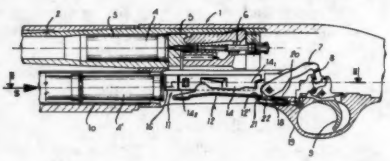
DEVICE FOR THE TIMELY FEEDING OF CARTRIDGES IN SEMI-AUTOMATIC RIFLES

Pier G. Beretta, Gardone, Italy, assignor to Fabrica d'Armi P.Beretta S.p.A., Italy

Filed Feb. 28, 1985, Ser. No. 706,714
Claims priority, application Italy, Mar. 27, 1984, 5135 A/84
Int. Cl.[4] F41C 5/00
U.S. Cl. 42—21 4 Claims

1. In a device for the timely feeding of cartridges to semi-automatic rifles comprising a barrel, a cartridge chamber

within said barrel, a breech block for opening and closing said cartridge chamber, a firing pin on said breech block, a hammer for striking said firing pin, a catch for engagement with said hammer, a trigger for disengaging said hammer from said catch, a magazine for holding reserve cartridges, spring means for feeding said cartridges from said magazine, a lift for receiving said cartridges one at a time from said magazine and for



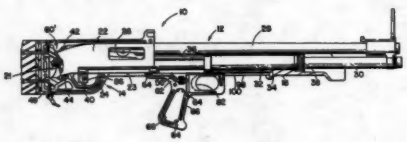
delivering them to said cartridge chamber, and a composite lever for controlling the passage of said cartridges from said magazine to said lift, the improvement comprising a sliding member, said sliding member being actuated in one direction by a spring and in the opposite direction by said hammer, said sliding member cooperating with said lift so as to positioning it to receive from said magazine a fresh cartridge in advance of the striking of said firing pin by said hammer.

4,601,123

CONVERTIBLE SHOTGUN

Thomas F. Swearengen, Burton, S.C., and Walter J. Makauskas, Prospect, Conn., assignors to O. F. Mossberg & Sons, Inc., North Haven, Conn.

Filed Jan. 10, 1984, Ser. No. 569,748
Int. Cl.[4] F41C *7/08, 17/08, 23/00*
U.S. Cl. 42—72 **17 Claims**



1. A convertible firearm comprising a basic firearm and a retrofit assembly, the basic firearm having a receiver, a barrel projecting forwardly from the receiver, firing means contained within the receiver and including a firearm trigger extending from the receiver and safety means for disabling the firing means and including a first safety member supported on the receiver and normally movable relative to the receiver between a safe position wherein the firing means is disabled and an off position wherein the firing means is operable to discharge the firearm, said retrofit assembly including a housing assembly having a plurality of housing sections cooperating in assembly with each other and with the basic firearm and enveloping at least a portion of the basic firearm, means for releasably securing said housing sections in assembly, and disabling means associated with the housing assembly for retaining the safety member in its off position.

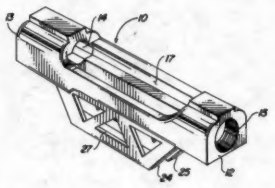
4,601,124

APPARATUS FOR INCREASING THE RIGIDITY OF A RIFLE ACTION RECEIVER

Edwards Brown, Jr., Phoenix, Ariz., assignor to Sturm, Ruger & Company, Inc., Southport, Conn.

Continuation-in-part of Ser. No. 462,207, Jan. 31, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 714,961
Int. Cl.[4] F41C *11/00*
U.S. Cl. 42—75.03 **10 Claims**

9. A method for increasing the rigidity of a conventional pre-existing rifle action receiver of the type which includes a forward receiver ring, a rear receiver ring, a receiver port, having a first length and having first and second longitudinal edges for receiving a cartridge magazine, an adjacent port, a bolt which reciprocates within said receiver authorized to engage a cartridge and urge it into a chamber at a front wall of said receiver, comprising;



bonding a first plate having a length greater than said first length along an edge thereof to said first longitudinal edge, said forward receiver ring and said rear receiver ring, and extending downward therefrom; and

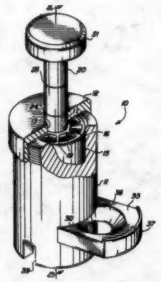
bonding a second plate having a length greater than said first length along an edge thereof to said second longitudinal edge, said forward receiver ring and said rear receiver ring, and extending downward therefrom.

4,601,125

MUZZLE LOADING APPARATUS

John Curtis, 105 Curtis La., Bloomfield, N. Mex. 87413

Filed Jan. 6, 1986, Ser. No. 816,426
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **14 Claims**



1. A device for facilitating the loading of muzzle loading firearms including in combination;

a housing having inner and outer concentric cylinders therein, said inner and outer cylinders being open at both the first and second ends thereof;

a removable cap for engagement with one end of said housing for closing the first end of said outer cylinder, said cap having an opening therethrough, said opening aligned with the first end of said inner cylinder when said cap closes said first end of said outer cylinder;

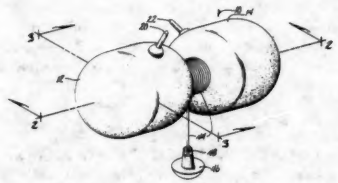
a ramrod for insertion through the opening in said cap for extension into said inner cylinder; and

means carried by said housing for selectively closing and opening the second end of at least said outer cylinder.

4,601,126
BUOYANT MARKING DEVICE FOR FISHERMEN

Howard W. Klocksiem, Paton, Iowa 50217

Continuation-in-part of Ser. No. 494,800, May 16, 1983, Pat. No. 4,516,349. This application Apr. 30, 1984, Ser. No. 605,156
Int. Cl.[4] A01K *93/00*; B63B *21/52*
U.S. Cl. 43—17.5 8 Claims

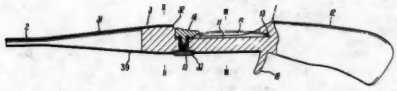


1. A buoyant marker light for fishermen, comprising,
a pair of buoyant body members,
an elongated means connecting said body members so as to define a center axis of said marker light,
light elements secured to each of said body members and protruding outwardly from said body members at a radially angular disposition with respect to each other, the angle of disposition being greater than zero degrees and less than 180 degrees.

4,601,127
FISHING ROD AND A MANUFACTURING METHOD THEREFOR

Yoshimi Maeda, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 15, 1984, Ser. No. 620,939
Claims priority, application Japan, Jul. 28, 1983, 58-118137[U]; Nov. 22, 1983, 58-180823[U]; Nov. 24, 1983, 58-181846[U]; Dec. 5, 1983, 58-230434; Dec. 29, 1983, 58-249850; Apr. 24, 1984, 59-60241[U]
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—18.5 14 Claims



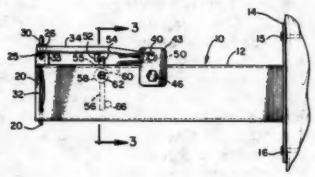
1. A fishing rod comprising a handle having a reel mounting portion and a grip, a rod body, and a tubular fitting portion joining said rod body with said handle, said tubular fitting portion having a tapered portion at which said rod body is connected with said tubular fitting portion and a fitting portion which is in continuation of said tapered portion and is fitted onto said reel mounting portion of said handle, said fitting portion having a cutout portion at least a portion of its length exposing therethrough said reel mounting portion of said handle to the exterior.

4,601,128
SNARE TRAP WITH TUBULAR BODY

Carl L. Danison, 2079 Jewel La., Loxahatchee, Fla. 33470

Filed Jan. 9, 1985, Ser. No. 690,036
Int. Cl.[4] A01M *23/34*
U.S. Cl. 43—82 15 Claims

1. An animal trap comprising:
a hollow elongated body;
a snare comprising a cable having at one end thereof means for slidably engaging one end of said cable to said cable so as to form a loop of variable diameter, said loop encircling an interior cross section of said body;
a spring biased spring arm pivotally mounted to said body, the free end of said spring arm being engageable with the free end of said cable; and,
trigger means mounted interiorly of said body and extending through said body and engageable with said spring arm, said trigger means holding said spring arm in tension with said biasing, and releasing said spring arm when pulled by an animal appendage inserted into said hollow body, so as to tighten said snare around said appendage;
the trigger means comprising a hook portion opening towards said loop and extending through an opening in said body, said hook portion engaging a hook on said spring arm opening in the opposite direction so as to hold said spring arm in tension with said spring biasing, said trigger means being pivotally mounted; and, an actuating

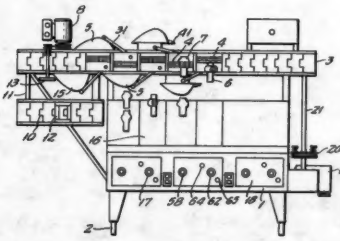


portion extending below said pivotal mounting, said pivotal mounting having an axis located and directed such that when said actuating portion is pulled toward said loop said hook portion is pivoted away from said hook on said spring arm so as to disengage said hooks and release said spring arm;
the free end of said cable having a washer thereon and a stop to prevent said washer from sliding off said end, and said free end of said spring arm having a yoke to receive said free end of said cable, said washer preventing said cable from slipping through said yoke, whereby when said spring arm is released by said trigger means and said trigger arm is moved by said spring biasing, said free end of said cable is also moved to tighten said snare and subsequently fall free of said spring arm.

4,601,129
MACHINE FOR VINE MATERIAL ENGRAFTING

Jivko N. Peev, and Penko M. Siderov, both of Veliko Tirnovo, Bulgaria, assignors to Zavod "Avtomatika", District Russe, Bulgaria

Filed Jun. 13, 1984, Ser. No. 620,107
Claims priority, application Bulgaria, Jun. 15, 1983, 61343
Int. Cl.[4] A01G *1/06*
U.S. Cl. 47—6 8 Claims



1. A machine for performing multiple functions in preparing stem materials for grating, comprising:
frame means;
a sorting device composed of endless apron conveyor, said endless apron conveyor is mounted for circulating move-

ment about the top portion of said frame means, a series of calibrated cams mounted on said frame means and associated with said endless apron conveyor, said endless apron conveyor including a plurality of cam actuated measuring clamps and means causing circulating movement of said endless apron conveyor past said calibrated cams whereby said measuring clamps are actuated by said calibrate cams;

storage pocket means for collecting and storing, separately, respectively-sized materials to be grafted;

each said measuring clamp including a movable jaw and an unmovable jaw, said movable jaw including a cam follower lever assembly, said cam follower lever assembly having a lever arm and a cam following control pin perpendicular to said lever arm, whereby upon circulation of said endless apron conveyor, the measuring clamp will be actuated by the action of the cam follower lever assembly as the control pin follows the profile of the cam;

each said cam including a movable lamella means at the leading side of the cam for initial contact with said cam following control pin;

said calibrated cams being disposed in a series of upwardly disposed lobes and a series of downwardly disposed lobes, with the lobes of each series being disposed between the lobes of other series, each storage pocket corresponding in location with a respective lobe of a respective calibrated cam whereby upon circulation of said endless apron conveyor, materials can be deposited in a storage pocket for materials of a predetermined size by the action of the cam follower pin on the calibrated cam corresponding to the respective storage pocket;

a charging zone where materials to be grafted can be inserted into the measuring clamps;

a one-disk cutting apparatus, said one-disk cutting apparatus being mounted on said frame means and having a power source;

a two-disk cutting apparatus, said two-disk cutting apparatus being mounted on said frame means and having a power source;

a graft stem trimming means mounted on said frame means for shaping the ends of said materials to be grafted; and

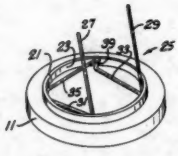
an auxiliary apron conveyor disposed below a portion of said endless apron conveyor and means powering said auxiliary conveyor with said apron conveyor.

4,601,130

RETAINER FOR ATTACHING A FLOWER CONTAINER LID

Gregory Du Vall, Santa Monica, Calif., assignor to Teleflora, Inc., Los Angeles, Calif.

Filed Jul. 5, 1984, Ser. No. 628,218
Int. Cl.[4] A01G 5/00
U.S. Cl. 47—41.12 **10 Claims**



1. In combination:

a container for holding flowers with their stalks projecting through an opening therein;

a lid removably mountable on the container to close the opening when the container is not in use for holding flowers, the lid including spaced, opposed recesses on its underside;

a body of stalk-supporting material removably positioned within the container for receiving and supporting the ends of the flower stalks, with the blossoms of the flowers positioned outside the container; and

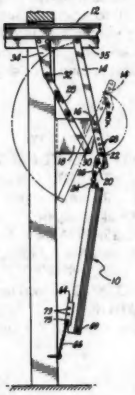
an elongated, flexible retainer having a generally U-shaped portion with first and second legs that can be selectively flexed within a common plane to engage and be retained by the lid recesses, and further having first and second integral extension portions that project outwardly from the ends of the respective first and second legs, the extension portions being sufficiently long to extend through the container opening to engage and be supported by the body of stalk-supporting material, with the U-shaped portion and the lid located outside the container, adjacent to the blossoms of the flowers held in the container.

4,601,131

COUNTERBALANCE SPRING MEANS

Roland Ozols, 1335 N. Baker Ave., Ontario, Calif. 91764

Filed Nov. 2, 1984, Ser. No. 667,560
Int. Cl.[4] E05D 15/40
U.S. Cl. 49—206 **8 Claims**



1. Spring means particularly adapted for use in place of spiral tension spring means in a conventional spring-loaded counterbalancing system with a kicker assembly for a garage door of the type designed to swing between a vertical closed position and a horizontal overhead open position, said spring means comprising, when installed for use:

a spiral compression spring;

a steeply sloping tubular housing for said spiral compression spring within which the spring is disposed in freely compressible condition;

a pulley disposed beneath the spiral compression spring in said tubular housing and adapted to move freely in the longitudinal direction therewithin;

a cable adapted to fit said pulley and means securing one end thereof against movement relative to said tubular housing at a point above the bottom of said compression spring, said cable being looped down around said pulley from its secured end and having its other end extending from the tubular housing and connected to said kicker assembly;

cooperating means permitting compression of said spiral compression spring by upward movement of said pulley in the tubular housing;

whereby closing of the garage door causes the kicker assembly to pull the cable upwardly and thereby raise the pulley within said tubular housing to compress said compression spring, and opening of the door is facilitated by properly directed pulling force thereon exerted through the pulley and cable by the expanding compression spring.

4,601,132

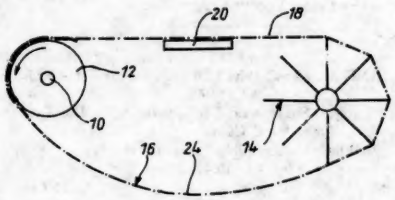
MACHINE EQUIPPED WITH A GRINDING BAND

Helmut Stahl, Bergle 5, 7205 Böttingen, Fed. Rep. of Germany

Filed Jan. 7, 1985, Ser. No. 689,065

Int. Cl.[4] B24B *21/00*

U.S. Cl. 51—135 BT **22 Claims**



1. In a grinding machine using a longitudinal grinding band, and including a frame, a driven contact disk having an axle, and supported in the frame on said axle, a rotatable rerouting unit having a shaft disposed approximately parallel with said axle, said grinding band being guided over said contact disk and over said rerouting unit,

the improvement in said rerouting unit comprising

a plurality of members peripherally spaced from one another and extending transverse to the longitudinal direction so as to form substantially line-shaped supports for said grinding band, each member having a concavely formed side facing said grinding band, whereby the grinding band operatively assumes a substantially polygonal shape as seen in a sideview thereof.

4,601,133

MANIPULATOR HEAD WITH GRINDING DEVICE FOR PIPES OR PIPELINES

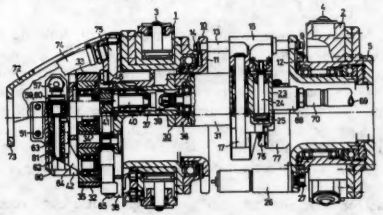
Georg Gebald, Kirchehrenbach; Heinz Röhrich, Nuremberg; Clemens Dippold, Bamberg, and Siegfried Förner, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 31, 1985, Ser. No. 761,057

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3447551

Int. Cl.[4] B24B *21/00*

U.S. Cl. 51—135 R **13 Claims**



1. Manipulator head for remote-controlled positioning and operation of a grinding device within a pipe, comprising two support flanges having radially outwardly drivable clamping devices and radially disposed guide elements for rollingly extending the manipulator head, a frame rotatably mounted in said support flanges and rigidly connecting said two support flanges axially, a grinding device fastened to said frame, said grinding device including a grinding tool, a drive and bearing member for said grinding tool, a drive device for axially adjusting said grinding device, and a feed drive device for radially fine-feeding said grinding tool, motor means for rotating said frame relative to said support flanges, connections for feed lines of said drive devices disposed on only one of said support flanges, said frame being formed of two bearing flanges clamped together by means of spacer sleeves and clamping bolts extending through said spacer sleeves, a base carriage guided on said spacer sleeves so as to travel axially to the manipulator head, a spindle nut of a driven threaded spindle mounted on said bearing flanges being disposed in said base carriage, a support carriage mounted on said base carriage and carrying, substantially in the center thereof, said axially arranged drive motor for said grinding tool, a base plate secured in parallel with said support flange to said support carriage via a pipe sleeve extending concentrically to a shaft of said motor means and passing through the other support flange free of connections for feed lines, said grinding tool comprising a driven abrasive belt disposed on said base plate and guided over three guide rollers, respectively, formed as a drive roller, a tensioning roller and a grinding roller having said fine feed, and a retaining clip secured to said base plate, said retaining clip extending over and beyond said grinding tool to the axis of the manipulator head and having connections thereon for said feed lines.

4,601,134

BELT GRINDER HAVING PRESSURE PADS WITH INDIVIDUALLY VARIABLE CONTACT PRESSURES

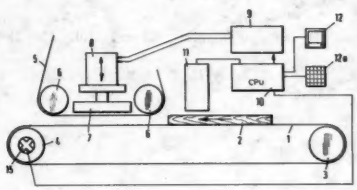
Jürgen Hessemann, Bad Oeynhausen, Fed. Rep. of Germany, assignor to Karl Heesemann Maschinenfabrik GmbH & Co. KG, Bad Oeynhausen, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 690,987

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402104

Int. Cl.[4] B24B *21/08*

U.S. Cl. 51—138 **17 Claims**



1. A belt grinder for grinding a workpiece, comprising:

a pressure beam, said pressure beam comprising a plurality of pressure pads arranged adjacent to each other in a line transverse to a direction of transport of said workpiece through said belt grinder; and

contact pressure means, connected to each of said plurality of pressure pads, for varying individually and continuously a contact pressure which said pressure pad applies to said workpiece, whereby a variation in contact presssure is provided along said pressure beam.

4,601,135

ALUMINUM SHINGLE ACCESSORIES

Billy H. Ellis, 2822 SE. Loop 820, Fort Worth, Tex. 76140, and Randall Ellis, 7505 Ridgeway, Fort Worth, Tex. 76180

Division of Ser. No. 493,153, May 10, 1983, Pat. No. 4,489,532, which is a division of Ser. No. 260,001, May 4, 1981, Pat. No. 4,411,120. This application Dec. 21, 1984, Ser. No. 684,465

Int. Cl.[4] E04D *1/36*

U.S. Cl. 52—58 **5 Claims**

1. Base means for supporting metal shingles on a building, each shingle being of the type having a lower forwardly projecting flange for engaging an interlocking slot of another shingle, the base means comprising in combination:

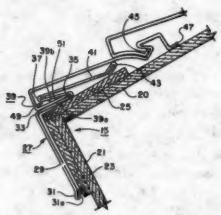
roof decking on the building with at least one eave and at least one gable end;

a plurality of accessories, each having two flat portions

joined to each other and forming a corner, each flat portion having a free edge; and

a channel formed in each accessory adjacent the corner;

one of the accessories being secured at the eave with the channel extending upwardly and forwardly above the decking for receiving the flanges of the shingles forming a



first row, and with one of the flat portions serving as a drip edge;

another one of the accessories being secured to the gable end with the channel extending downwardly for receiving downwardly bent edges of the shingles located at the gable ends, with the other of the flat portions serving as a drip edge.

4,601,136

SEMICIRCULAR ARCHING ROOF TYPE PIPE-FRAME GREENHOUSE WITH MONITOR ROOF-LIKE PROTRUSION

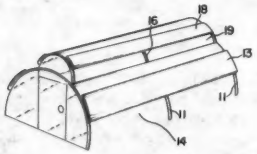
Jusuke Watanabe, Tokyo, Japan, assignor to Watanabe Pipe Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,137

Claims priority, application Japan, Jul. 21, 1982, 57-110782[U]

Int. Cl.⁴ A01G *9/24*; E04B *1/34*

U.S. Cl. 52—63 **7 Claims**



1. A semicircular arching roof-type pipe-frame greenhouse which comprises:

(a) a plurality of main pipe-frame rib members of each a semicircular or inverted U-shaped form erected upright on the ground in parallel with each other,

(b) at least one main longitudinal connecting member connecting the main pipe-frame rib members together to form a skelton of a main room of the greenhouse,

(c) a main sheet member for the walls of the main room made of a transparent or translucent film or sheet of a plastic resin and attached to the skeleton of the main room in such a manner that at least a part thereof longitudinally of the greenhouse is capable of being opened and closed according to need,

(d) a plurality of auxiliary pipe-frame rib members each, surmounted on the top portion of a respective main pipe-frame rib member extending upwardly in parallel with each other,

(e) at least on auxiliary longitudinal connecting member running in parallel with the main longitudinal connecting member and connecting the auxiliary pipe-frame rib members together to form a skeleton for a monitor roof-like protrusion or clerestory on the ridge of the main room, and

(f) an auxiliary sheet member for the walls of the monitor roof made of a transparent or translucent film or sheet of a plastic resin and attached to the skeleton of the monitor roof in such a manner that at least one opening is provided therein longitudinally of the greenhouse capable of being opened and closed according to need.

4,601,137

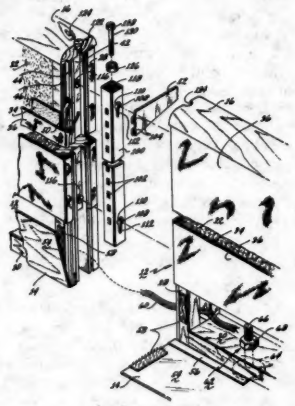
LOCKING MECHANISM FOR AN OFFICE PANEL SYSTEM

Norman H. Bates, Santa Ana, Calif., assignor to The Tandem Group, Inc., Buena Park, Calif.

Filed Jul. 29, 1983, Ser. No. 518,692

Int. Cl.⁴ E04B *2/76*

U.S. Cl. 52—63 **26 Claims**



1. A locking mechanism for joining first and second panels along facing sides and with the facing sides formed by side rails integral to the panels and with each panel including a top rail member extending along the full length of the panel and adjacent a top rail of an adjacent panel and with the edges of adjacent top rails including complementary facing recesses together forming an opening passing through the adjacent top rails, including

a tubular member extending along the side rails forming the facing sides of the panels,

a recess integrally formed in each of the side rails forming the facing sides of the panels and with each recess of a depth to receive approximately half the width of the tubular member and with each recess of a width substantially the same as the depth of the tubular member to have the tubular member substantially enclosed by the facing recesses,

at least one locking member extending within each recess and with the locking members each having an enlarged head with a chamferred surface positioned within the recess,

the tubular member including locking openings corresponding in number and position to the locking members and with the locking openings formed with an enlarged portion to receive the enlarged head of the locking member to have the enlarged head with the chamferred surface positioned within the interior of the tubular member and with the locking openings formed with a tapered elongaged portion extending from the enlarged portion and with the width of the tapered elongaged portion smaller than the size of the enlarged head with the chamferred surface, and

means positioned within and passing through the opening

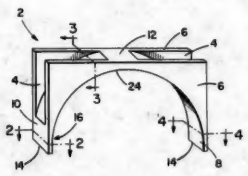
formed in the adjacent top rails for moving the tubular member axially to position the locking members within the elongated portions of the locking openings to have the chamferred surface of the enlarged heads captured against the tapered elongated portions of the locking openings of the tubular member to lock each of the panels to the tubular member and draw each of the facing sides of the panels against each other to firmly attach and align the panels to each other.

4,601,138

PREFABRICATED ARCHWAY

Wade J. Hampton, 3313 N. 68th St., #134E, Scottsdale, Ariz. 85251

Filed Dec. 4, 1984, Ser. No. 677,979
Int. Cl.[4] E06B *1/32*
U.S. Cl. 52—86 **21 Claims**



1. A prefabricated archway attached to a framed opening, said prefabricated archway comprising:
a single body including
a curved section being concavely curved and having a planar face defining a curvature of an archway,
two side walls extending from said planar face,
an exterior surface of each of said two side walls being located continuous with one of opposed longitudinal edges of said planar face,
an outer periphery of said two side walls being shaped complementary to said framed opening to space said planar face from said framed opening when said single body is attached within said framed opening so as to form said archway within an opening defined by said framed opening, and
a distance between the exterior surfaces of said two side walls when said single body is attached within said framed opening is equal to a width of said framed opening which includes a drywall covering defining exterior surfaces of said framed opening so as to align said exterior surfaces of said framed opening continuous with the exterior surface of said two side walls and continuous with said planar face of said curved section.

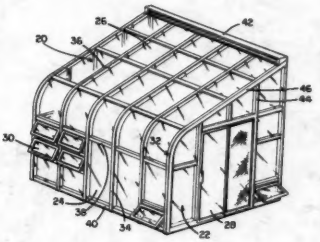
4,601,139

METHOD AND FRAMEWORK FOR A GREENHOUSE OR THE LIKE INCLUDING A REVERSIBLE GABLE ADAPTOR

Joseph Esposito, Dix Hills, N.Y., assignor to Four Seasons Solar Products Corp., Farmingdale, N.Y.

Filed Apr. 2, 1984, Ser. No. 596,091
Int. Cl.[4] E04B *7/02, 1/38*
U.S. Cl. 52—90 **19 Claims**

1. A light permeable structure comprising an open framework, light permeable glazing on said structure to define an enclosure, said framework including opposed sections including respective vertical structural members of like construction and in mirror image of each other, said framework further including sloped members adapted to rest atop said vertical members, and first and second wedge shaped means having like conformation mounted between the vertical and sloped members to support the sloped members on respective of the vertical members, said wedge shaped means having surfaces to rest atop the vertical members and to rest against the sloped members, said wedge shaped means being of a configuration to be interchangeably mounted between either of the vertical members and the corresponding sloped member and connectible to at least one of the same whereby the vertical members can be arbitrarily mountible in either of the opposed sections, said vertical members being hollow extrusions having like cross-sections and defining like internal bores, said wedge



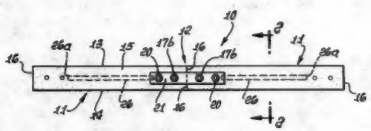
shaped means including prongs extending into the bores to locate and brace the wedge shaped means on the vertical members, said structure further comprising shim means between at least one of the vertical members and the associated wedge shaped means to provide a snug fit between the wedge shaped means and vertical and sloped members, the shim means being a flat generally C-shaped member with an open end to permit bypassing said prongs.

4,601,140

LAWN EDGING SYSTEM

Robert W. Russo, 19006 E. Heber St., Glendora, Calif. 91740

Filed Apr. 11, 1985, Ser. No. 722,139
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—102 **7 Claims**



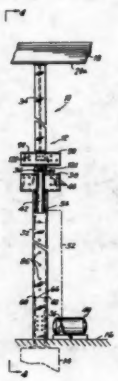
1. In a landscape edging, the combination comprising
(a) multiple, elongated, concrete strips extending end-to-end, to form joints therebetween, each strip having a top, bottom, opposite sides and opposite ends,
(b) multiple fasteners carried by said strips, each strip having opposite end portions from each of which two fasteners project sidewardly from the side of the strips,
(c) elongated ties to which the fasteners are connected, each tie extending at the sides of two successive strips and bridging the joint therebetween, to hold the strips in endwise assembled relation and to prevent misalignment between the strips, successive strips interconnected by one tie,
(d) each tie being connected to four fasteners, two of which project from one strip and two of which project from the next successive strip,
(e) and including sleeves extending protectively about the fasteners within each strip, the sleeves extending to opposite side faces of the strips, and
(f) each strip containing a reinforcing bar that extends endwise therein and is everywhere spaced from said fasteners, but is located generally in alignment with the fasteners.

4,601,141

BUILDING STRUCTURE EXPANSION APPARATUS

Frank Donnelly, 93 Belvedere Ave., Oxford, N.J. 07863

Filed Jun. 14, 1984, Ser. No. 620,675
Int. Cl.[4] E04B 5/58
U.S. Cl. 52—126.6 7 Claims



1. Apparatus for extending the height of a building comprising:

a plurality of columns which are vertically oriented with respect to ground level;

each column comprising an outer section and at least one inner section telescopically disposed within said outer section;

at least one jack assembly including a pair of jacks mounted to said outer section and adapted to move upward and downward, said jack assembly operatively connected to said inner section for raising said inner section into an extended position relative to said outer section in response to the upward movement of said jack assembly;

clamping means including a pair of gripping jaws pivotally mounted on said jack assembly for said upward movement, with said gripping jaws securely gripping said inner section during said upward movement to bring and hold said inner section in said extended position;

each of said gripping jaws of each pair of gripping jaws positioned in opposing relationship to each other, such that said gripping jaws grasp said inner section upon said upward movement of said jack assembly;

means for maintaining said inner section secured to said outer section and mounted between said gripping jaws, such that said gripping jaws can be brought into releasably secured contact with said inner section;

said clamping means being released upon downward movement of said jack assembly;

said inner section being fabricated from steel in the form of a wide flange beam having an I-shaped cross sectional configuration integrally formed with a pair of flanges separated by a web, said gripping jaws contacting the exterior surfaces of said flanges;

said means mounted between said gripping jaws including a nut-and-bolt assembly journalled and releasably secured between said gripping jaws;

each of said jacks mounted on the top of said outer section including a piston adapted for movement in an upward direction and in a downward direction along the vertical axis of said column, a pivotal connection assembly mounted between said piston and the respective gripping jaw, such that upward movement of said piston will create a vertical moment of force through said pivotal connection assembly to achieve pivotal action of said gripping jaws against said inner section; and

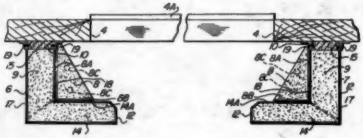
said gripping jaws including a pair of mounting plates secured to said pivotal connection assembly, and tips on said mounting plates fabricated from material of a hardness coefficient sufficiently greater than the hardness coefficient of said steel of said inner section, such that said tips will impinge the steel surface of said inner section upon said upward movement of said piston.

4,601,142

LOADING DOCK SHELTERS

Robert J. Frommelt, Peosta, Iowa, assignor to Frommelt Industries, Inc., Dubuque, Iowa

Filed May 2, 1984, Ser. No. 606,339
Int. Cl.[4] E04H 14/00
U.S. Cl. 52—173 DS 13 Claims



7. A loading dock shelter for attachment to a wall having a doorway therein, comprising:

a head pad for extending along the top of the doorway in the wall,

two side pads for extending along the respective lateral sides of the doorway, and

means for supporting said head pad and said side pads on the wall in outwardly projecting relation thereto in position to be operatively engaged by the top and sides of the rear of a truck backed into loading or unloading position relatively to said doorway in the wall, each of said side pads comprising an elongated body portion having upper and lower ends with said body portion adapted to extend upwardly and downwardly on the wall along one of the lateral sides of the doorway and an elongated leg portion extending along the length of said body portion in position adapted to be disposed outwardly from the doorway, said elongated leg portion integral with said elongated body portion and projecting inwardly toward the other of said side pads and adapted to extend across a portion of said doorway and at least two stabilizing wedges attached to said elongated body portion and said elongated leg portion, with each of said wedges positioned at the upper and lower ends of said side pads to retain and position said leg portion toward the other of said side pads across a portion of said doorway, and

a core of compressible resilient material positioned in each of said side pads, a cover of fabric material disposed in covering relation to the front and lateral side portions of said core of compressible resilient material and reinforcing means mechanically connecting said cover on said side pads for maintaining the shape of said side pads.

4,601,143

FIRE RATED WALL/DOOR SYSTEM

William F. O'Keefe, and Sonny Q. Garcia, both of San Francisco, Calif., assignors to O'Keefe's, Inc., San Francisco, Calif.

Filed Jan. 26, 1984, Ser. No. 574,010
Int. Cl.[4] E04C 1/94
U.S. Cl. 52—171 6 Claims

1. A fire rated structure system comprising:

a fire rated transparent glass assembly having outer layers of transparent tempered glass enclosing an inner layer of transparent heat-absorbing gel medium, said assembly having a peripheral edge;

frame means for supporting the assembly and protecting the

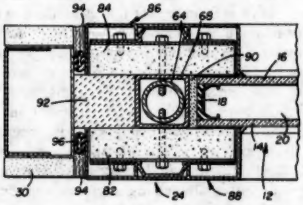
peripheral edge from a fire so as to prevent delamination of the glass from the gel medium;

a fire rated wall;

means for mounting the frame means into said fire rated wall so as to accommodate expansion of the assembly and frame to prevent assembly and frame bowing and assembly delamination;

said mounting means including:

(a) a rod extending from one of said frame means and said wall;



(b) a cylinder means for receiving and guiding said rod, said cylinder means extending from the other of said frame means and said wall from which said rod extends, with said rod being urged further into said cylinder means as said assembly and frame expand; and

(c) flexible fire rated material covering said rod and said cylinder means and extending between said frame means and said fire rated wall.

4,601,144

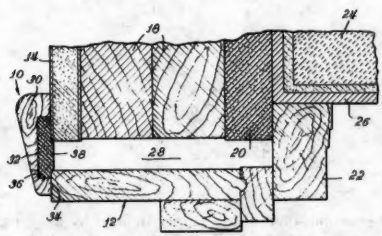
BUILDING INSULATING AND TRIMMING SYSTEM

Jerome Tinti, W249 S8540 Center Rd., Mukwonago, Wis. 53149

Filed Oct. 9, 1984, Ser. No. 658,528

Int. Cl.[4] E06B *1/04, 1/62;* **E04F** *19/04*

U.S. Cl. 52—211 **9 Claims**



1. A system for trimming, insulating and sealing between two separate and disparate elements of a building structure, which elements, due to construction tolerances, normally have a gap therebetween large enough to permit influx or egress of air, comprising

a. an elongated strip having a facing side and an insulating side, said strip having a width greater than the width of said gap, such that said strip, when installed over said gap, bridges between said two elements with said insulating side,

b. said facing side comprising a visible side of said strip to provide an asthetic trim between said building elements,

c. said insulating side comprising an invisible side of said strip when installed, and including a channel extending the length of said strip, said channel having a width greater than the width of said gap, and having a particular depth,

d. a compressible insulant disposed in and adhering securely to said channel, said insulant having a width greater than the width of said gap and said insulant having a thickness greater than the depth of said channel such that said insulant extends outwardly from said channel and protrudes from said insulating side to conform to and provide a seal upon contact with an element of building structure.

4,601,145

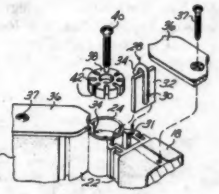
ADJUSTABLE ROOM PARTITION

Roger Wilcox, 56862 Inwood Ct., Elkhart, Ind. 46516

Filed Aug. 5, 1985, Ser. No. 762,630

Int. Cl.[4] E04B *1/343;* **A47G** *5/00*

U.S. Cl. 52—238.1 **3 Claims**



1. A room partition comprising a plurality of partition members, each partition member including spaced end edges and top and bottom edges, one of said end edges positioned adjacent an end edge of a second partition member, a post positioned between said partition member adjacent end edges, a hook secured to each partition member at one of said top and bottom edges, and said hooks constituting means for rotatably securing said partition members to said post wherein said partition members are shiftable between a multiplicity of positions and a cap member removably secured to one of said post top and bottom edges, said cap member constituting means for securing said partition members in one of said multiplicity of positions, said cap member including peripheral notches, said notches for accepting and securing said hooks and partition members between one of its said multiplicity of positions.

4,601,146

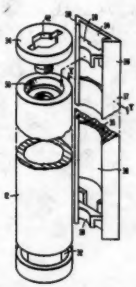
POST COVER FOR SPACE DIVIDING WALL PANEL SYSTEM

Mark A. Harter, Hamilton, and Raoul J. P. Schoumaker, Wyoming, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 21, 1984, Ser. No. 582,207

Int. Cl.[4] E04H *1/00;* **E04B** *1/00*

U.S. Cl. 52—239 **7 Claims**



1. In a space dividing wall panel system including space dividing wall panels and cylindrical support posts, said cylindrical support posts having panel connecting and supporting annular slots therein, at least one space dividing wall panel supported by said annular slots, the improvement comprising:

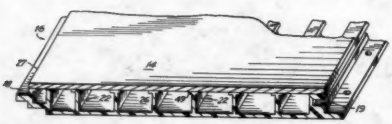
one or more post covers having at least one inner and one outer planar surface secured to each of said cylindrical posts, said at least one inner surface having at least a pair of spaced, hook-shaped connectors thereon constructed and arranged to coact with the annular slots in said support post to thereby cover any exposed surface of said support post when said support post is supporting one or more space dividing wall panels.

4,601,147

ASSEMBLY SYSTEM FOR INSTALLING MARBLE PANELS

Neil Migliore, 234 New York Ave., Huntington, N.Y. 11743

Filed Aug. 16, 1985, Ser. No. 766,270
Int. Cl.⁴ E04F *13/08, 13/00*
U.S. Cl. 52—275 **11 Claims**



1. An assembly system for installing individual marble panels to a flat surface comprising:

individual marble panels formed of a flat sheet of marble and a mounting carrier secured thereto,

each said mounting carrier comprising a front attaching surface and a rear mounting surface for attachment to said flat surface, one side edge of said carrier comprising a groove and the opposite side edge comprising a tongue insertable into a groove in an adjoining marble panel,

each said mounting carrier comprising an extension on said one side edge, said extension having apertures enabling said marble panel to be attached to said flat surface,

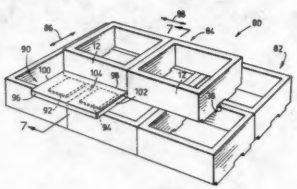
said marble sheet of each marble panel being substantially coextensive with and secured to a respective front attaching surface such that side edges of each marble sheet positioned between adjacent marble sheets on said flat surface are aligned with and abut side edges of said adjacent marble sheets, when said tongues of respective mounting carriers are inserted into said grooves of adjacent mounting carriers.

4,601,148

MODULE FOR WALLS AND FREE STANDING STRUCTURE

Angelo Risi, and Antonio Risi, both of P.O. Box 370, Gormley, Canada (L0H 1G0)

Filed Jun. 24, 1983, Ser. No. 507,505
Int. Cl.⁴ E04B *1/04*
U.S. Cl. 52—284 **6 Claims**



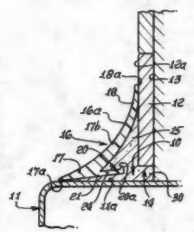
1. A building module in the form of a hollow body defined by an upstanding surrounding wall formation of rectilinear outline, said hollow body presenting opposed front and rear outer and inner faces and opposed side outer and inner faces and having a generally planar upper and lower surface and a substantially constant wall thickness throughout the extent of any given face, a pair of matching depending lug formations presented respectively below the said lower planar surface in each of the regions of said opposed side faces only and wherein each said depending lug formation in the region of said front outer face is rearwardly separated therefrom an extent measured rearwardly along said lower planar surface less than the thickness between said front outer and inner faces so as to define a first recess formation and in the region of said rear outer face is forwardly separated therefrom an extent measured forwardly along said lower planar surface greater than the thickness between said rear inner and outer faces so as to define a second recess formation and with each said lug formation having an extent front to rear corresponding to the separation between said inner front and inner rear faces whereby when the lower surface of one such module is presented to the upper surface of another such module one of said depending lug formations so presented thereto is registrable within the other such module to extend between the front inner and rear inner faces and with said first and second recess formations engaging the upper planar surface thereof in offset aligned mating relation therewith and displaceable thereover throughout a range of offset aligned mating positions between the opposed inner side faces thereof.

4,601,149

STRIP TO PROTECT AND SEAL BATH TUB CORNERS

Pierre E. Dokan, 11240 Chandler Blvd., N. Hollywood, Calif. 91601

Filed Jun. 24, 1985, Ser. No. 747,786
Int. Cl.⁴ E04D *1/36*
U.S. Cl. 52—287 **13 Claims**



1. The combination with a corner defined by an upright wall, and a generally horizontal surface as defined by a bath tub or the like, and cured mastic applied to said corner,

(a) a longitudinally elongated, plastic strip, which is generally crescent shaped in cross section, the strip having terminal edges defined by laterally spaced lips supported adjacent said wall and said surface so that the strip confines the mastic in said corner in strip installed position,

(b) the mastic in cured state being incompletely rigid,

(c) and barb means integral with the strip and projecting therefrom into the mastic, which in said cured state anchors the barb means to retain the strip in said installed position,

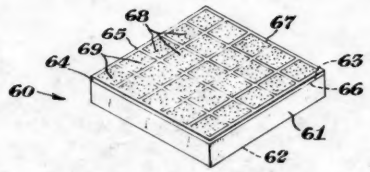
(d) said strip having geater thickness medially between said lips than at said lips, whereby the lips support said strip for flexing toward the corner, said mastic being resilient in cured state, and tensioning said barb means to urge the strip toward said corner, with said lips resiliently engaging said wall and surface, the mastic engaging the strip proximate both lips.

4,601,150

ROOFING ELEMENT AND ROOF EMPLOYING SUCH ELEMENT

Cathy W. Dougherty, Reynoldsburg, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 4, 1985, Ser. No. 697,816
Int. Cl.[4] E04C 1/40
U.S. Cl. 52—309.12 12 Claims



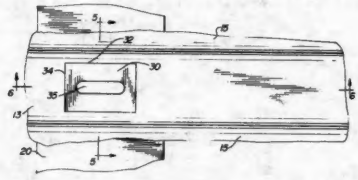
1. In a laminate of an inorganic mortar and a closed cell synthetic resinous layer of generally planar configuration wherein a cementitious layer is affixed to a synthetic resinous foam layer to provide a laminate generally resistant to foot traffic when the cementitious layer is positioned in an uppermost position, the improvement which comprises incorporating within the cementitious layer a reticulate sheet, the sheet having a plurality of openings defined therein wherein the area of the openings is from about 50 to 98 percent of the area of the major surface of the reticulate sheet, the openings extending between first and second major surfaces of the reticulate sheet, a plurality of foam engaging means projecting outwardly from the sheet to thereby affix the reticulate sheet to the resinous layer.

4,601,151

WELDED ROOF SUPPORT

Charles L. Nunley, Dallas, and Joe W. Tomaselli, Plano, both of Tex., assignors to Loadmaster Systems, Inc., Dallas, Tex.

Filed Sep. 4, 1984, Ser. No. 647,041
Int. Cl.[4] E04B 7/04
U.S. Cl. 52—410 3 Claims



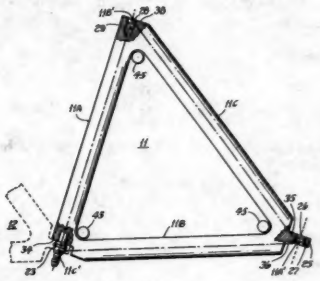
1. In a roof deck functioning as a structural diaphragm to provide rigidity to a building: spaced purlins; corrugated sheet material supported from below and spanning the distance between said purlins; weld washers having an elongated noncircular slot extending perpendicular to the direction of the purlin on the upper surface of valleys of the corrugated sheets; and spaced welds formed in the elongated slots in the weld washers, said weld extending through and bonding the weld washer, the valley of the corrugated sheet and the purlin, said welds having a length extending transversely of the purlin and resisting rotation of the valley on the corrugated sheet in a horizontal plane.

4,601,152

TRUSS STRUCTURE AND METHOD OF CONSTRUCTION

Anthony P. Coppa, Merion, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Apr. 27, 1984, Ser. No. 605,372
Int. Cl.[4] E04H 12/00
U.S. Cl. 52—637 5 Claims



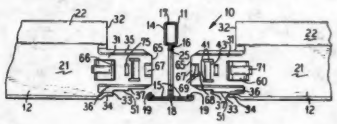
1. An elongate prism-form truss structure defined by three parallel lateral edges and having an equilateral triangular cross section perpendicular to said lateral edges, said structure comprising a plurality of planar, congruent, triangular frame elements each having first, second and third sides opposite structurally mutally different first, second and third vertices respectively, said first and second sides of each of said elements being substantially equal in length and said third side of each of said elements being substantially $2/\sqrt{3}$ times one of the shorter sides, said elements being joined at their vertices and being arranged in three separate groups in said structure such that each lateral edge contains all first sides of the elements of a single group only and another lateral edge contains all first vertices of said last-recited group of elements.

4,601,153

SUSPENDED CEILING SYSTEM

James J. Dunn, Carpentersville, and John S. Borucki, Bloomingdale, both of Ill., assignors to Chicago Metallic Corporation, Chicago, Ill.

Filed Jun. 14, 1985, Ser. No. 744,625
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—666 15 Claims



1. A suspended ceiling system comprising main members extending parallel to each other and cross-members extending between the main members at spaced intervals, each of said members having an inverted T configuration with a pair of oppositely extending flanges connected by a web to a bead, each cross-member having ends with the flanges terminating in an offset lip and the web having an integral tongue extending beyond both the end surfaces of the bead and flanges, each of the webs of the main runners having elongated slots for receiving the tongue of the cross-member with the offset lip of the flange of the cross-member being received on an outer edge of the flange of the main member and the bead being spaced from the bead of the main member, each of the tongues having shoulder means for engaging the web of the main runner adja-

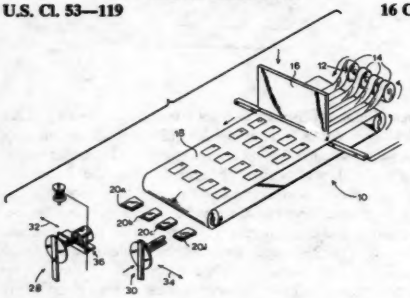
cent the elongated slot, first means cooperating with the elongated slot and the shoulder means to lock the tongue in the slot and second means cooperating with the second means on another tongue to interconnect the two tongues together to form an end-to-end joint between cross-members extending in the elongated slot from opposite directions, said first means being a tab bent from the tongue to form a catch surface facing away from the end of the tongue and toward said shoulder means, said shoulder means being of a dimension to limit insertion of the tongue into the slot but able to pierce the web of the main member adjacent the elongated slot when the system is subjected to heat to cause thermal expansion of the cross-member.

4,601,154

AUTOMATIC PACKAGING UNIT FOR BAG MAKING MACHINE

Steven Ausnit, New York, N.Y., assignor to Minigrip Inc., Orangeburg, N.Y.

Filed May 29, 1984, Ser. No. 614,488
Int. Cl.[4] B65B *63/04*
U.S. Cl. 53—119 **16 Claims**



1. An apparatus for forming secured bundles of bags comprising:

means for accumulating first and second stacks of a predetermined number of bags on first and second slotted plates;

first and second pairs of spaced fingers for respectively grasping said first and second stacks and for lifting said stacks off said slotted plates each said pair being rotatable;

at least one station comprising a support plate for one of said stacks and cooperating with said pairs of fingers for forming said stacks into bundles, means for rotating said first and second pairs of fingers to roll said one of said one first and second stacks against said support plate while said one stack is at said station to form said bundle; and

means for moving said first pair of fingers back and forth between said first slotted plate and said station along a first path and for moving said second pair of fingers back and forth between said second slotted plate and said station along a second path, said first and second paths being non-intersecting.

4,601,155

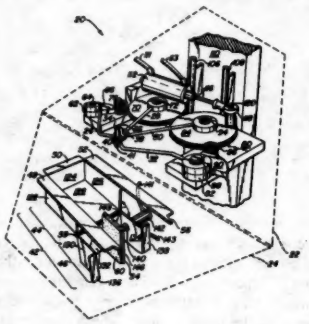
ELASTIC BAND APPLICATION SYSTEM

Paul A. Lewis, Salinas, Calif., assignor to Robert Alameda and Richard Cooper, both of Salinas, Calif.

Filed Sep. 14, 1984, Ser. No. 651,224
Int. Cl.[4] B65B *11/00*
U.S. Cl. 53—176 **6 Claims**

1. An automatic mail banding apparatus for encircling two elastic bands round a stack of pieces of mail with one of said bands oriented transversely to the other of said bands, said banding apparatus including mail receiving tray means, releasable clamping means mounted to said tray means and formed to hold said pieces of mail in a stack in said tray means, and band applying means mounted proximate said tray means and formed to expand an elastic band and position the expanded band around said stack in said tray means and to release the expanded band for application to said stack, wherein the improvement in said mail banding apparatus comprises:

said tray means having a movable portion mounted for movement between a first orientation and a second orientation transverse to said first orientation, said clamping means being formed to clamp said pieces in said stack to said movable portion of said tray means for movement therewith while clamped in said tray means, means for



moving said movable portion and clamping means for displacement thereof between said first orientation and said second orientation, said tray measns being formed to expose a portion of said stack for release of an elastic band therearound in each of said first orientation and said second orientation; and

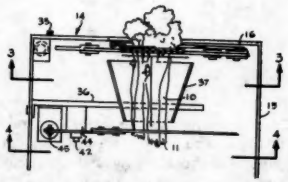
said band applying means being formed for release of a first band around said stack in said first orientation and for release of a second band around said stack when said stack is in said second orientation.

4,601,156

APPARATUS FOR BUNCHING, TRIMMING, AND BANDING VEGETABLES

Curtis L. Parry, and Gary R. Cushing, both of Salinas, Calif., assignors to Salinas Valley Engineering & Mfg., Inc., Salinas, Calif.

Division of Ser. No. 380,515, May 21, 1982, Pat. No. 4,470,241.
This application Jul. 30, 1984, Ser. No. 635,918
The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.
Int. Cl.[4] B65B *13/02*
U.S. Cl. 53—399 **2 Claims**



2. The method of preparing a vegetable bunch having stalks and heads, such as broccoli, in an apparatus having top plate with a center opening, a plurality of arms with fingers movable to receive and stretch an elastic band below said top plate, a hollow truncated cone-shaped guide below said fingers with the larger opening of the cone facing upwards and a knife

below said cone all positioned along a center axis passing through said top plate center opening, the steps of:

placing an elastic band on said fingers and moving said plurality of arms apart to stretch said band about said center opening,

gathering vegetables and inserting them stalk first through said center opening; said stretched elastic band, and said guide until the stalks are sufficiently numerous to be squeezed together a predetermined amount by said truncated conical guide and, a sufficient distance such that all heads contact said top plate;

actuating said plurality of arms to relax said elastic band onto said stalks,

actuating said knife to cut the stalk bottoms an equal length at a plane close to said guide while maintaining said vegetable heads in contact with said top plate; and

moving said vegetables bunch axially to disengage said elastic band from said fingers and remove said bunch with elastic band from said apparatus.

4,601,157

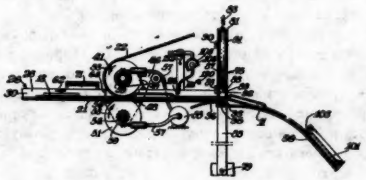
AUTOMATIC PACKAGING

Herbert B. Adelman, Hockessin, Del., assignor to The Crowell Corporation, Newport, Del.

Filed Mar. 15, 1984, Ser. No. 589,699

Int. Cl.[4] B65B *9/02, 51/30*

U.S. Cl. 53—450 **9 Claims**



1. In the process of automatically packaging a series of articles to be protected against mechanical shock as well as against static electricity or corrosion, the improvement according to which the articles are successively sandwiched between the foam faces of sheets of backed plastic foam in which the foam is a cushioning layer not over about 3/16 inch thick adhered to backing that is not over about 1/16 inch thick but has a tensile strength at least twenty times that of the foam, the face of the sandwiching foam is coated with an anti-stat or corrosion-inhibiting layer, the backing is or is a laminate of aluminum foil, and the sandwiched sheets are heat-sealed to each other by applying the heat-sealing heat to the backing.

4,601,158

CONTAINER FLAP FOLDING APPARATUS AND METHOD

Richard Hahn, Trenton, N.J., assignor to Champale, Inc., Trenton, N.J.

Filed Nov. 23, 1983, Ser. No. 554,977

Int. Cl.[4] B65B *7/20*

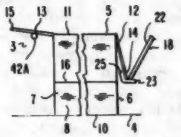
U.S. Cl. 53—491 **12 Claims**

10. Method of folding container flaps comprising

moving automatically along a longitudinal path in forward direction successive spaced apart closable flap containers of the type having relative to such path a transverse front end and a transverse back end as well as a bottom portion and a top portion and provided at the top portion with outwardly and downwardly prefolded corresponding transverse front and back end flaps terminating at outer free edges located at a corresponding intermediate level between the top portion and bottom portion, such that the end flaps are arranged to be upwardly and inwardly folded across the top portion,

maintaining a front flap puller normally positioned in the path at a lower position for contact with the front end of an oncoming such container below the outer free edge of the outwardly and downwardly folded front flap thereof during the forward movement of the container, and upon such contact automatically displacing the puller upwardly and forwardly to an upper position above yet adjacent the top portion of the container for pulling the front flap upwardly and for relatively urging the upwardly pulled front flap rearwardly to fold the flap inwardly and downwardly across the top portion during the continued forward movement of the container,

maintaining a back flap lifter selectively upstream of the puller along the path and normally positioned out of the path at a lower position, and at substantially about the same time that the container contacts the puller also automatically moving the lifter into the path, and both upwardly from below the outer free edge of the outwardly and downwardly folded back flap of the container into raising contact with such flap and relatively forwardly of the back end of the container, to an upper position above yet adjacent the top portion of the container for lifting the back flap upwardly and forwardly for locating the outer free edge thereof during the continued forward movement of the container, and thereafter returning the pusher to its lower position,



automatically forwardly directing the upwardly and forwardly lifted back flap inwardly and downwardly to fold the flap across the top portion during the continued forward movement of the container, and

automatically maintaining the puller in its upper position until the entire container moves therepast, and thereafter returning the puller to its lower position for contact with the front end of the next oncoming such container.

4,601,159

FORM-FILL-SEAL MACHINE AND METHOD WITH CAPABILITY FOR PROVIDING A VACUUM OR INERT GAS ATMOSPHERE WITHIN THE PACKAGE

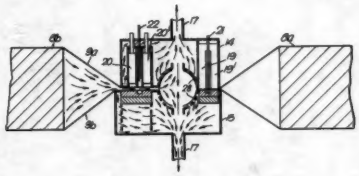
Giorgio Mugnai, Rho, Italy, assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Aug. 16, 1985, Ser. No. 766,220

Claims priority, application United Kingdom, Sep. 14, 1984, 8423209

Int. Cl.[4] B65B *31/08, 31/06, 9/06, 9/20*

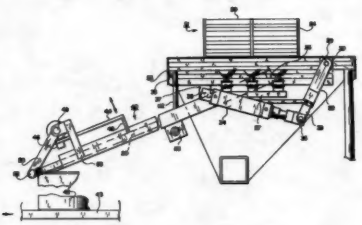
U.S. Cl. 53—511 **4 Claims**



1. Apparatus for packaging articles in plastics film, comprising:

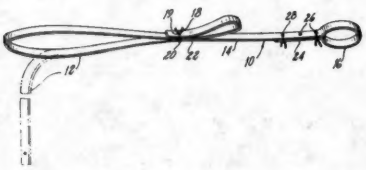
(a) means for advancing a succession of packages enclosed within a tubular film along a first direction of movement;
(b) transverse sealing and severing means to sever the film portions enclosing the respective product articles from one another and to seal the ends of said film portions along seal lines transverse to said first direction; and
(c) means for extracting air from within a said tubular film portion whose end is being sealed; wherein said sealing and severing means comprise
(i) jaws mounted for movement towards and away from said first direction of movement in a direction mutually perpendicular to both the extent of the severing line and said first direction, so as to allow a said article to pass between the jaws and then to close together to clamp a film region between two successive said articles for air extraction and severing,
(ii) and an air extraction chamber extending along each said jaw for a length at least as great as the said seal line thereof; and
(iii) wherein said carrier members include an air extraction chamber provided with means for opening an end of a said tubular film portion being severed and sealed, for maintaining that film portion wide-open along the full length of said end in communication with said air extraction chamber;
(iv) the jaws including gas-pervious suction regions along one side thereof, for holding the opposed walls of a said tubular film portion apart to maintain the interior of said tubular film portion in communication with said air extraction chamber during extraction of air through the open end of said tubular film portion,
(d) first severing means to rupture said film between the jaws along a first transverse severance line in said region between two successive articles for severing the tubular film portion enclosing the respective said adjacent articles:
(e) second severing means to one side of said first severing means for trimming an unsealed end of a first said tubular film portion between the jaws;
(f) third severing means to the other side of said first severing means for trimming an unsealed end of a second said tubular film portion which end is used for extraction of air from within said second tubular film portion before the operation of said third severing means:
(g) first sealing means alongside and second severing means for providing a trim seal at said end of the first tubular film portion; and,
(h) second sealing means alongside said third severing means for providing a trim seal of said second tubular film portion.

4,601,160
COVER SEPARATING, FEEDING, PLACING AND METERING APPARATUS
Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417
Filed Mar. 8, 1985, Ser. No. 709,897
Int. Cl.[4] B65B *7/28*; B67B *3/062*
U.S. Cl. 53—485 **61 Claims**



1. A cover-dispensing apparatus adapted to receive covers and, in a stacked array, separate and deliver a cover, one at a time, to a gravity chute or guideway whereby and at a metering and at an applying station the forwardmost cover is positioned and pressed on a top rim of a traveling container, said dispensing apparatus including:
(a) guide means for receiving a multiplicity of covers in a stacked array and positioning said covers in way of separating and dispensing means;
(b) a plurality of at least three pairs of jaws radially arranged and disposed so that a first set of jaws is moved and movable toward and away from a lowermost first cover to provide support means in way of a lower rim of said first cover of the stack, and when the jaw is moved from said rim provides escapement of said first cover, after which the jaws are again moved to a cover-support position;
(c) a second set of clamp jaws disposed and moved in timed concert with said first set of jaws, the movement of said second set of jaws toward and away from a second cover, and alternately providing a clamp and engagement of this above second cover while the first cover is released and to release said second cover after the first cover has been moved from in way of the first set of jaws;
(d) a plurality of vacuum cups carried on and by a swinging arm and means to actuate said vacuum and the movement of said arm so as to grasp by said vacuum cups the first cover as it is released by the first jaws and move said first cover to a delivery position;
(e) a gravity chute or guideway adapted to receive the released covers, one at a time, and in a single thickness array, carry said covers to a metering station;
(f) metering means adapted to come in way of advancing covers and to inhibit the proceeding of a following cover to a cover-applying station until a forwardmost cover has been placed on a traveling or advancing container, and
(g) positioning and pressing means at said cover-applying station with a cover-applying means progressively pressing a cover from a leading to a trailing edge to and onto an upper rim of a container while actuating the metering means to prevent undue advancement of a succeeding cover.

4,601,161
LEG UP STRAP
Ronald H. Drellich, 2131 N. 61st Ave., Hollywood, Fla. 33024
Filed Feb. 4, 1985, Ser. No. 698,232
Int. Cl.[4] B68C *1/16*
U.S. Cl. 54—46 **20 Claims**



10. Apparatus for mounting a horse or other four legged animal comprising a strap having a first loop portion constructed and arranged to fit around the shoulder of said horse on the side opposite the mounting side of said horse, a flexible belt connecting portion extending from one end fixed to said first loop portion over and across the back of said horse to its other end portion down below the mounting side of said horse, and a second loop portion fixed to the other end portion of said flexible belt connecting portion to hang downwardly therefrom and capable of supporting a rider's weight when mounting the horse, said apparatus being free of any element engaging the belly of said horse.

4,601,162

ROTARY MOWING ATTACHMENT FOR A TRACTOR AND THE LIKE

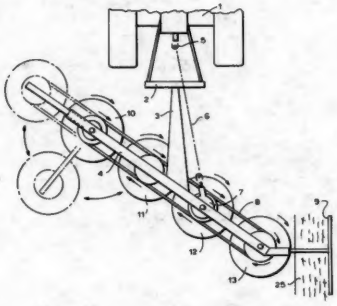
Ulrich Wessel, Gottmadingen, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG - Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,520

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410312

Int. Cl.[4] A01D *55/26*

U.S. Cl. 56—13.6 **10 Claims**



1. In a rotary mowing attachment for a tractor and the like comprising a transverse support attached to said tractor by a towing bar orientable at an acute angle to a travel direction of said rotary mowing attachment, a plurality of mowing drums attached under said transverse support parallel to each other so as to each be rotatable, said rotary mowing drum being offset from each other in said travel direction of said rotary mowing attachment, the work zones of said rotary mowing drums overlapping, the improvement which comprises means for swinging at least one of said mowing drums through substantially 180° around an upright axis of a neighboring mowing drum with the angle of an axis of the swingable mowing drum with respect to the ground maintained unchanged.

4,601,163

GARDEN TOOL

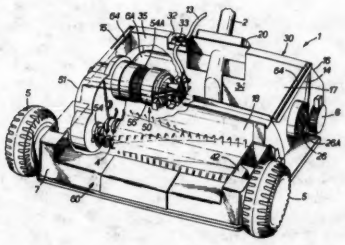
Alan Trelford, Fleet, England, assignor to Black & Decker Inc., Newark, Del.

Filed Dec. 12, 1984, Ser. No. 680,787

Claims priority, application United Kingdom, Apr. 10, 1984, 8409220

Int. Cl.[4] A01D *7/00*

U.S. Cl. 56—16.7 **13 Claims**



1. A garden tool, comprising:

a body molded in one piece from plastics material, the body having two sides, a front part, a middle part, and a rear part;

an electric motor received in a motor chamber defined in said middle part;

a ground engaging assembly rotatably mounted in said front part;

rear means, rotatably mounted in said rear part, for supporting said body;

front means, rotatably mounted on said front part, for supporting said body;

said front part having a curved back wall which is upwardly forwardly inclined, and an upright wall spaced forwardly of said curved wall, said curved wall and said upright wall defining a space therebetween in which said ground engaging assembly is disposed;

said middle part having a bottom wall from which upwardly extend said curved wall and a rear wall spaced rearwardly thereof to define said motor chamber which is upwardly open;

said curved wall and said rear wall being connected by said sides;

a cover fitted over the top of the motor chamber thereby closing the latter, said cover having two downwardly depending side sections extending outside said sides;

said rear part having a top wall and an open bottom;

a socket extending downwardly from the top wall of said rear part and being connected to said rear wall;

a handle having a portion engaged in said socket;

said motor having one end engaged in an opening in one of said sides;

a gear box connected between said one end of said motor and said ground engaging assembly and being located in an enclosed space defined between said one of said sides and one of said side sections of said cover;

air openings in said side sections of said cover; and

an air opening in the other of said sides communicating with said motor compartment.

4,601,164

AUTOMAT LOCATION SYSTEM

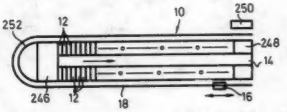
Jürg Bischofberger, Elsau, and André Lattion, Seuzach, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 611,610

Claims priority, application United Kingdom, May 24, 1983, 8314305

Int. Cl.[4] D01H *15/02*

U.S. Cl. 57—263 **9 Claims**



1. An open end spinning machine having a plurality of spinning stations and a service tender movable along a predetermined path past said stations, each station comprising a spinning unit having a part pivotable between a first position in which said spinning unit is closed and a second position in which said spinning unit is open, said part being retainable in each said position, each said part providing a rail element, guide means on said tender including a first guide element to engage said rail element on a part in said second position thereof.

4,601,165

METHOD OF MANUFACTURING A COMPACT, MULTILAYER SINGLE STRAND REINFORCING CORD FOR USE IN ELASTOMERIC PRODUCTS AND A CORD PRODUCED BY THIS METHOD

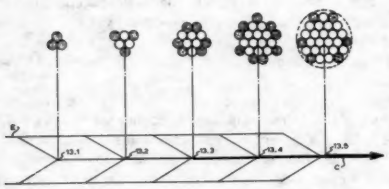
Wolfgang Weidenhaupt, Erkelenz; Günter Wepner, Waldfeucht-Neuhaaren, and Peter Dismon, Heinsberg-Porselen, all of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Jun. 7, 1985, Ser. No. 742,548

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421118

Int. Cl.[4] D07B *1/06, 3/00;* D02G *3/48*

U.S. Cl. 57—213 **16 Claims**



1. A method of manufacturing a compact, multilayer single strand reinforcing cord, particularly for use in elastomeric products, the cord being produced in a single stranding process in which a plurality of metal wires of the same diameter are fed into a set of stranding points arranged one after the other in the direction of advance of a processed strand, comprising the steps of feeding at least two and at most four wires into the first stranding point; feeding into the subsequent stranding points additional wires, whereby behind each stranding point adjacent peripheral portions of preceding wires delimit valleys in the contour of the processed strand, the number of said additional wires fed into respective subsequent stranding points before the last stranding point corresponding to the number of valleys present on the processed strand whereby each valley provides a stable deposition zone for a wire, and feeding into the last stranding point only as many additional wires as needed for a desired compactness of the resulting cord.

11. A multilayer, single strand, compact reinforcing cord particularly for use in elastomeric products, comprising at least twelve metal wires of the same diameter and in which each wire occupies the same relative cross-sectional position over the entire length of the cord; the cord being produced by feeding two or at most four wires into a first stranding point; feeding into the subsequent stranding points additional wires forming inner layers, whereby behind each stranding point adjacent peripheral positions of preceding wires delimit valleys in the contour of processed strand, the number of the additional wires behind the subsequent stranding points corresponding to the number of valleys present on the processed strand and each valley providing a stable deposition zone for a wire over the entire length of the cord; and the number of the additional wires fed into the last stranding point to form an outer layer corresponding to a number of valleys delimited by three adjoining wires on the strand.

4,601,166

SPINNING DEVICE

Hans Raasch, Amselstrasse 1,, 4050 Monchen-Gladbach, Fed. Rep. of Germany

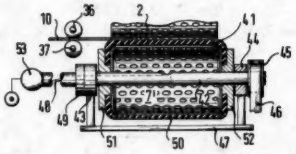
Filed Apr. 30, 1984, Ser. No. 605,626

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3315777

Int. Cl.[4] D01H *1/135, 7/885*

U.S. Cl. 57—401 **14 Claims**

1. Spinning device for manufacturing a twisted thread at least partially formed of spinning fibers, comprising a perforated drum rotating about a given axis of rotation, a suction device disposed in said drum, said suction device having at least one suction opening formed therein extended substantially parallel to said given axis of rotation, means disposed outside said drum opposite said suction opening for forming a wedge-shaped area for spinning fibers, means for conducting flying spinning fibers into said wedge-shaped area, means for



pulling out a spun thread substantially parallel to said given axis of rotation, said wedge-shaped area forming means including a shell carrier rotating about a longitudinal axis and a flexible shell disposed on said shell carrier, and means disposed inside said shell for varying the outside diameter of said flexible shell.

4,601,167

APPARATUS FOR MAKING A YARN

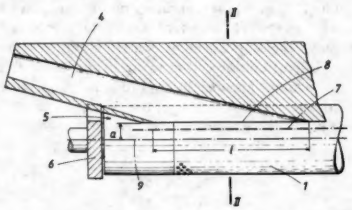
Helmut Fuchs, Linz, Austria, assignor to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria

Filed Jun. 29, 1984, Ser. No. 626,211

Claims priority, application Austria, Jul. 13, 1983, 2553/83

Int. Cl.[4] D01H *1/135, 7/885*

U.S. Cl. 57—401 **4 Claims**



1. In apparatus for making a yarn from single fibers having an average length up to a predetermined upper limit, which apparatus comprises

two juxtaposed and closely spaced apart suction drums having the same axial direction and defining a common diametral plane, said drums defining between them a generally triangular space which tapers to said common diametral plane and being adapted to be rotated in the same sense, and

a fiber-guiding duct which extends at an acute angle to the axial direction of said drums into and toward one end of said generally triangular space and has an outlet opening which is disposed in said generally triangular space close to both said drums, said duct being adapted to deliver said single fibers through said outlet opening to said generally triangular space so that said drums, when rotating in the same sense, are adapted to twist said single fibers together to form a yarn extending in said axial direction,

the improvement comprising that

the length of said outlet opening in said axial direction is at least as large as said upper limit of said average length and not in excess of twice the upper limit of said average length, and

said outlet opening is so arranged that the arc length of the periphery of each of said drums from the point which is

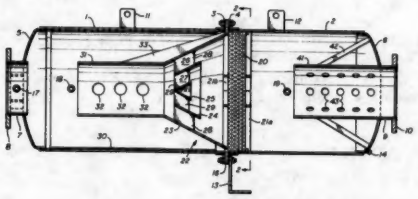
nearest to said outlet opening to said common diametral plane is not in excess of 0.9 radians.

4,601,168

NOISE AND EMISSION CONTROL APPARATUS

Harold L. Harris, P.O. Box 19835, Houston, Tex. 77024

Filed Dec. 12, 1984, Ser. No. 680,804
Int. Cl.[4] F01N *3/28*
U.S. Cl. 60—299 **17 Claims**



1. Combination noise and emission control apparatus for use with an internal combustion engine comprising:

an enclosed cylindrical housing having an inlet at one end thereof for connection with the exhaust of said engine and having an outlet at the opposite end thereof;

noise reduction means mounted in said housing for reducing the noise emitted from said engine, said noise reduction means including at least one tubular member having a first end which opens toward said inlet and a second end opposite therefrom;

converter means mounted in said housing for reducing noxious gases emitted from said engine, said converter means including a catalytic cell, transversely disposed in said cylindrical housing so as to separate an upstream portion of said housing from a downstream portion of said housing, for converting nitrogen oxides, carbon monoxides and unburned hydrocarbons entering said upstream portion of said housing with said exhaust gases to less noxious compounds in said downstream portion of said housing for discharge through said outlet; and

diffuser means connected to said second end of said noise reduction means tubular member and disposed in said cylindrical housing between said catalytic cell and said inlet to diffuse and distribute said exhaust gases entering said upstream portion of said housing across said catalytic cell.

4,601,169

CHECK DEVICE FOR A REDUNDANT FLIGHT CONTROL APPARATUS

Konrad Hesse, and Guenter Diessel, both of Mainz, Fed. Rep. of Germany, assignors to Feinmechanische Werke Mainz GmbH, Mainz, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 646,951
Claims priority, application European Pat. Off., Sep. 7, 1983, 83108792.9
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—406 **5 Claims**

1. In a redundant flight control apparatus comprising a plurality of variable displacement pumps each having a zero delivering position, a full stroke position and intermediate positions,

at least a group of servo drive devices, and

at least a manually operable control means for controlling said group of servo drive devices,

each said pump having supply and return line means connected to at least one of said servo drive devices, each said servo drive device including

a control valve for directional control of said supply and return line means,

a bypass valve for putting the servo drive device out of operation, and

an actuator having a double-acting piston,

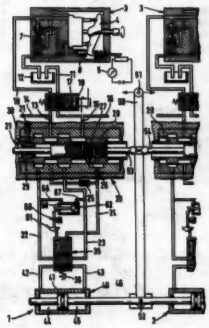
said control valve including a control spool for directionally controlling said supply and return line means and a push-over spool mounted for relative movement to said control spool for controlling pressure in a control line to said bypass valve,

said control line being normally on high pressure, and, when said push-over spool is moved relative to said control spool, on low pressure,

said bypass valve having a connecting through position for said supply and return line means when said control pressure is high, and a bypass position for shutting off said supply and return line means from said actuator and short circuiting said actuator, when said control pressure is low,

said manually operable control means being linked to said push-over spools of said group of servo drive devices and to said pistons of said actuators,

an improved check device for testing and detecting proper operation of said flight control apparatus comprising:



a group of flow-indicating instruments, each for detecting fluid flow in a particular one of said supply and return line means,

a group of test valves, each included in one of said supply and return line means upstream of said control valve and adapted to normally connect through and, when actuated, to shut off said supply line so as to influence a corresponding said pump,

which is connected to said particular supply and return line means, to take its zero delivering position, even if said manually operable control means is operated for a servo movement, and

locking means for independently locking each said control spool of said control valve of said group, said check device functioning in that situations can be brought about in an arbitrary manner, wherein said bypass valve should go into its bypass position, and wherein achieving of said bypass position can be detected by observing said corresponding flow indicating instrument.

4,601,170

EXPLOSIVE EVAPORATION MOTOR

Robert K. Fiege, 150 Greenway Trail, Carol Stream, Ill. 60188

Filed Apr. 3, 1984, Ser. No. 568,433
Int. Cl.[4] F01B *29/00*
U.S. Cl. 60—513 **1 Claim**

1. An explosive evaporation motor, comprising in combination

a compression chamber having a longitudinal axis,

said chamber being sealably closed at one end,

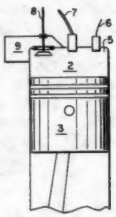
a piston disposed in said compression chamber and cyclically movable along said axis between a first end position

in proximity to said one end and a second end position remote from said one end of said chamber and from said first position,

means for heating said compression chamber to at least a preselected temperature,

means for injecting water vapor into said chamber between said piston and said one end of said chamber when said piston is at said first position, whereby said vapor is caused to explode and drive said piston toward said second position,

exhaust port means opening into said chamber for exhausting gas from said chamber when said piston is at said second position,



said compression chamber and said piston being constructed so as to prevent the introduction of gas into said chamber as said piston moves from said second position to said first position,

said chamber includes a cylindrical end wall and an end wall,

said exhaust port means comprises an opening in said end wall of said compression chamber,

valve means for closing said opening except when said piston is in proximity to said second position, and

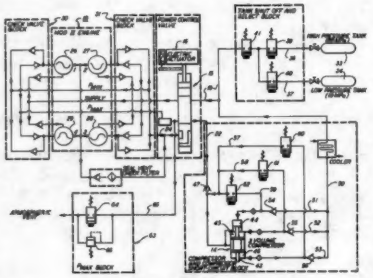
sealably closed chamber communicating with said opening.

4,601,171

CONTROL APPARATUS FOR HOT GAS ENGINE

Robert E. Stotts, Clifton Park, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,575
Int. Cl.[4] F02G *1/06*
U.S. Cl. 60—521 **19 Claims**



1. Apparatus for controlling the operation of a hot gas engine that includes

a hot gas engine having a positionable power controller for adding working gas to the engine from a supply line to increase engine power and releasing working gas from the engine to an outlet line to decrease engine power,

a plurality of tanks for supplying gas stored therein to the supply line, each tank being at a different pressure,

a plurality of compressor units each having an inlet that is connected to the engine outlet for pumping released gas from said engine and a discharge that is connected to the supply line to return the released gas to one of said tanks,

a first selector means for opening a selected one of the tanks to the supply line whereby gas can be added to the engine from the open tank or returned to the open tank from the compressor means, and

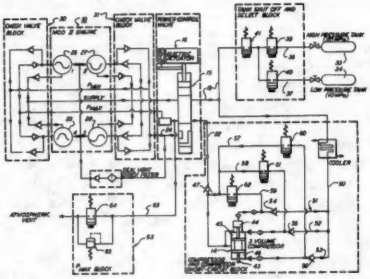
a second selector means for activating at least one of the compressor units to pump gas from the engine and return said gas to a selected one of said tanks.

4,601,172

MULTIPLE VOLUME COMPRESSOR FOR HOT GAS ENGINE

Robert E. Stotts, Clifton Park, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,576
Int. Cl.[4] F02G *1/06*
U.S. Cl. 60—521 **11 Claims**



1. Apparatus for pumping down a hot gas engine that includes

a multiple volume, single stage compressor having a plurality of axially aligned compression chambers, each chamber having a different capacity,

piston means reciprocally mounted in each chamber, said piston means being joined together whereby they move in unison within said chambers,

drive means connected to at least one of said piston means for reciprocating the piston means within said chambers,

intake means for connecting an inlet in each chamber to the engine for pumping working gas from said engine,

discharge means for connecting an outlet in each chamber to a gas supply reservoir for storing said gas,

a bypass loop associated with each chamber for connecting the inlet and the outlet of each chamber in communication, and

a positionable means in each loop selectively opening and closing the bypass loop whereby the capacity of the compressor can be changed.

4,601,173

HEAT TRANSFER METHOD AND APPARATUS

George M. Anthony, Eldorado Club, P.O. Box 346, Gardena, Calif. 90247

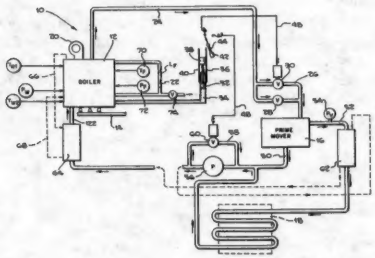
Division of Ser. No. 96,922, Nov. 23, 1979, Pat. No. 4,526,006.
This application Apr. 22, 1985, Ser. No. 725,915
Int. Cl.[4] F01K *13/02*
U.S. Cl. 60—667 **5 Claims**

1. A work performing system comprising:

boiler means for generating a vaporized working fluid, said boiler means being adapted to contain a body of liquid phase working fluid, said body of liquid phase working fluid having a liquid level;

prime mover means for utilizing said vaporized working fluid to perform work; and

means for controlling the flow of said vaporized working fluid to said prime mover means responsive to changes in said liquid level, said means for controlling including a liquid level sensing means for sensing changes in said



liquid level, and control valve means for controlling the flow of said vaporized working fluid to said prime mover means, said control valve means being actuatable by said liquid level sensing means.

4,601,174

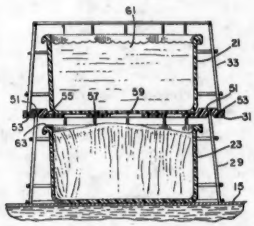
ICE BLOCK MAKING AND STORAGE SYSTEM

Roland B. Wilson, 1207 S. Lafayette St., Fort Wayne, Ind. 46802

Division of Ser. No. 424,901, Sep. 28, 1982, Pat. No. 4,498,595. This application Nov. 23, 1984, Ser. No. 674,527

Int. Cl.[4] F25C *1/04*

U.S. Cl. 62—66 **3 Claims**



1. The method of home freezing water in relatively large blocks comprising the steps of:

filling a plurality of flexible open top containers of a certain configuration with water to a preferred level;

placing a first filled container on the floor of a freezer;

surrounding the first container with a first set of four upstanding grid-like sidewalls extending from the freezer floor upwardly beyond the top of the first container;

supporting a first temporary grid-like floor upon the first upstanding sidewalls above said first container by inserting the upper circumferential edges of the upstanding walls into a groove on the lower face of said first grid-like floor; and

placing a second filled container on said first grid-like floor slightly within a depression of said first grid-like floor so as to prevent horizontal movement of said second container with respect to said first grid-like floor.

4,601,175

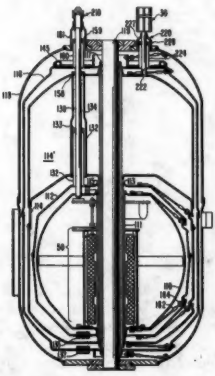
REDUCTION OF WATER CONDENSATION ON NECK TUBES OF CRYOGENIC CONTAINERS

George D. Kneip, Jr., Menlo Park; John H. Broshear, E. Alviso, and Marvin H. Anderson, Mountain View, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 536,489, Sep. 28, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,122

Int. Cl.[4] F17C *7/02*

U.S. Cl. 62—50 **1 Claim**



1. In a cryostat for maintaining a cryogenic liquid at the boiling point thereof,

vent means comprising a neck tube protruding exteriorly from said cryostat for permitting vapor of said boiling cryogen to discharge to the atmosphere through an open end thereof and for transferring heat to said vapor prior to discharge, said heat evolved interiorly of said cryostat whereby said vapor is substantially warmed prior to the discharge thereof,

ambient heat exchanger means cooperatively disposed with said vent means for transferring heat from the atmosphere to said vent means for further warming said vapor whereby atmospheric condensation on said vent means is minimized, said ambient heat exchanger means comprising tubular means for the passage of said vapor therethrough and a plurality of fins protruding radially from the exterior of said tubular means, said heat exchanger means disposed proximate the open end of said vent means.

4,601,176

WATER FROZEN AND WATER DEPLETION STATE SENSOR FOR AN ICE PRODUCT MAKING APPARATUS

Tomio Suyama, Toyoake, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Oct. 24, 1984, Ser. No. 664,143

Claims priority, application Japan, Nov. 14, 1983, 58-174762[U]

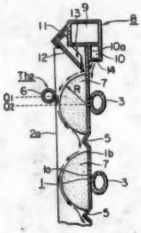
Int. Cl.[4] F25C *1/12*

U.S. Cl. 62—138 **4 Claims**

1. In an apparatus for making semi-cylindrical ice products, including a substantially vertically extending freezing plate having opposite vertically extending side edges, a front face, a rear face opposite said front face and a plurality of vertically extending horizontally spaced apart partitions on said front face between said opposite side edges, said partitions projecting a predetermined distance outwardly of said front face, surface portions of said front face between said partitions each defining respective pluralities of vertically aligned freezing sections, and means for freezing water into semi-cylindrical ice products of radius less than said predetermined distance during a freezing cycle on, and harvesting ice products during a har-

vesting cycle from said surface portions, one ice product on and from each freezing section, said freezing means including a cooling coil provided on said back surface of said freezing plate across each of said freezing sections, and a compressor for circulating a cooling medium through said cooling coil so as to freeze the semi-cylindrical ice products centered over said cooling coil in said freezing sections, and a frozen water and water depletion sensing unit, the improvement wherein:

said sensing unit includes a thermostatic temperature sensor having thermostatic contacts, mounted on said freezing plate astride two side-by-side ones of said partitions imme-



diately adjacent to one of said opposite side edges, over the topmost freezing section of the plurality of freezing sections between said side-by-side ones of said partitions at a position over and at least as high as the portion of said cooling coil across said topmost freezing section, so as to contact water flowing downward over said front face in spaced relation to the ice product being formed in said topmost freezing section all along the length of said sensor, and means, connected to said contacts and responsive to the temperature sensed by said sensor, for terminating said freezing cycle when the temperature sensed by said sensor reaches a preset temperature value.

4,601,177

REFRIGERANT OVER-CHARGING CHECKING SYSTEM OF CLOSED CIRCUIT REFRIGERATION AIR COOLING SYSTEM

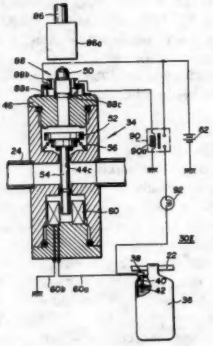
Mikio Tanino, Hatano; Eiji Tada, Fujisawa, and Tsutomu Takano, Zama, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jun. 25, 1985, Ser. No. 748,474

Claims priority, application Japan, Jun. 26, 1984, 59-131630; Sep. 11, 1984, 59-190017; Oct. 2, 1984, 59-206825; Oct. 26, 1984, 59-226565; Oct. 26, 1984, 59-226564

Int. Cl.[4] F25B *45/00*; F16K *31/18*

U.S. Cl. 62—149 **15 Claims**



1. In an air cooling system including a compressor, a condenser, a liquid tank, an expansion valve and an evaporator which are connected through conduit means to form a closed circuit refrigeration system,

a refrigerant over-charging checking system comprising:

a service valve mounted to said conduit means and having therein a refrigerant inlet passage for introducing the refrigerant into said closed circuit refrigeration system;

first means for blocking said refrigerant inlet passage when electrically energized; and

second means for electrically energizing said first mean when a refrigerant level in said liquid tank rises to a predetermined level.

4,601,178

ICE-MAKING MACHINE

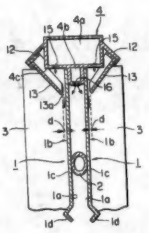
Tomio Suyama, and Tadashi Sakai, both of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Nov. 23, 1984, Ser. No. 674,090

Claims priority, application Japan, Nov. 24, 1983, 58-180044[U]

Int. Cl.[4] F25C *1/12*

U.S. Cl. 62—347 **6 Claims**



1. An ice-making machine comprising:

a pair of approximately vertically extending, spaced apart, parallel freezing plates having respective opposing rear faces and having respective front faces opposite said rear faces, said front faces having vertically extending, horizontally spaced apart partitions projecting outwardly therefrom so as to provide between said partions portions of said front face defining freezer sections, said opposing rear faces being spaced apart by a predetermined gap;

a cooling coil positioned between and secured to said rear faces in said gap; and

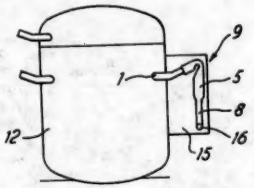
a water supply unit on the top of said freezing plates, said water supply unit including an ice-making water conduit, water guide plates extending downwardly from said ice-making water conduit into respective spaces between adjacent ones of said partitions toward said freezing sections, so as to direct ice-making water from said ice-making water conduit onto the respective freezing sections and position said water supply unit with respect to said freezing plates, and a flushing water conduit unified with said ice-making water conduit, closely received in said gap at the top of said freezing plates so as to further and securely position said water supply unit with respect to said freezing plates, said flushing water conduit having means for spraying water therein downward onto said rear faces.

4,601,179

DRYER FOR A REFRIGERATION PLANT

Gustav A. Johansson, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jul. 5, 1985, Ser. No. 752,124
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 3425735
Int. Cl.[4] F25B 43/04
U.S. Cl. 62—475 11 Claims



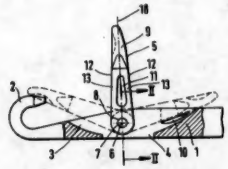
1. An encapsulated refrigerant compressor unit, comprising, a capsule casing for housing a compressor, suction and compression nipples and an auxiliary nipple for providing fluid communication between the interior and exterior of said casing each connected separately to said capsule casing, a flow through housing unit having an inner end thereof connected to said auxiliary nipple, a drying agent in said housing unit, and means for selectively opening and closing the outer end of said flow through housing to permit adding a refrigerant therethrough to the interior of said capsule casing.

4,601,180

LATCH NEEDLE FOR A TEXTILE MACHINE

Harald Mayer, and Georg Wild, both of Albstadt, Fed. Rep. of Germany, assignors to Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit Gesellschaft, Albstadt-Ebingen, Fed. Rep. of Germany

Continuation of Ser. No. 633,595, Jul. 23, 1984, abandoned. This application Dec. 9, 1985, Ser. No. 807,763
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3331031
Int. Cl.[4] D04B 35/04
U.S. Cl. 66—121 12 Claims



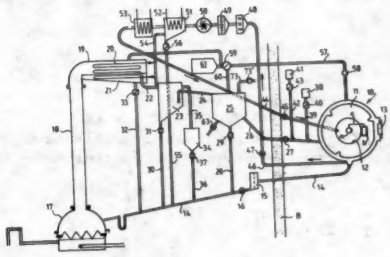
1. High speed knitting machine latch needle having
a needle shank (1) formed with a hook (2) at one end portion thereof and with a latch seating surfaces (10)
a needle latch (5) formed with a pivot bore (8) at one end portion thereof and pivotably retained on the shank (1), the latch being formed with a needle spoon (9) at the end remote from the bore (8) for engagement with the hook (2) when the needle latch is pivoted into closed position, the back of the spoon (9) of the latch having seating surfaces engaging the latch seat surfaces (10) on the shank when the needle latch is pivoted to open position,
and comprising
an arrangement to increase the elasticity of the needle latch (5) in the region between the seating surfaces on the back of the spoon (9) and the pivot bore, and to reduce the impact force between the needle latch and the needle shank as the latch is pivoted between open and closed positions which includes
at least one through-opening (11, 19) formed in the latch in the region between the spoon (9) and the pivot bore (8).

4,601,181

INSTALLATION FOR CLEANING CLOTHES AND REMOVAL OF PARTICULATE CONTAMINANTS ESPECIALLY FROM CLOTHING CONTAMINATED BY RADIOACTIVE PARTICLES

Michel Privat, 6, rue Monsigny, 75002 Paris, France

Filed Nov. 17, 1983, Ser. No. 552,971
Claims priority, application France, Nov. 19, 1982, 82 19457
Int. Cl.[4] D06F 43/08
U.S. Cl. 68—18 C 10 Claims



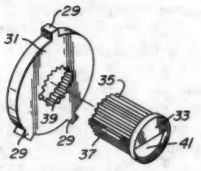
1. An installation for cleaning clothes and removal of particulate contaminants especially from clothing contaminated by radioactive particles, of the type which operates under atmospheric pressure in a dry-cleaning solvent medium, comprising a cleaning tank which is interposed on the one hand in a solvent regeneration circuit of the type consisting of a distillation unit, a condenser, a water separator, a solvent reservoir, and which is interposed on the other hand in a solvent recovery circuit of the condenser type for recovering the solvent entrained by the drying air, wherein each solvent container, namely the condenser, the water separator, the solvent reservoir of the solvent regeneration circuit and the condenser of the solvent recovery circuit, is connected independently and directly with interposition of a valve to the boiler of the distillation unit for cleaning purposes.

4,601,182

STEERING WHEEL DEVICE

Edward J. Glanzmann, 2139 Greyhorse Dr., Warrington, Pa. 18976

Filed Dec. 10, 1984, Ser. No. 679,738
Int. Cl.[4] B60R 25/04
U.S. Cl. 70—252 3 Claims



1. A steering wheel disabling apparatus for a motor vehicle, comprising:
(a) a steering support column;
(b) a steering wheel spindle rotatably mounted internal to and concentric with said steering support column;
(c) a steering wheel affixed to said steering wheel spindle;

(d) a steering shaft concentric with said steering wheel spindle and rotatably mounted thereto, said steering shaft having a splined end section;

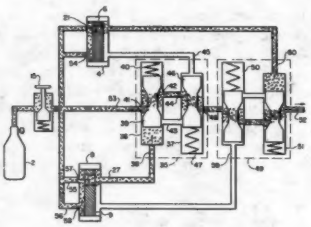
(e) a coverplate affixed to said steering wheel, said coverplate having an internally splined aperture and located above the splined end section of said steering shaft such that said aperture and said end section are spaced apart axially;

(f) a removable interlock cylinder having both internal and external splines, said internal spline engaging said steering shaft and said external splines engaging the splined aperture of said coverplate whereby said interlock cylinder may be manually retracted or inserted between said coverplate and said steering shaft in order that said steering shaft may be disengaged or engaged to said steering wheel.

4,601,183
PNEUMATIC KEY LOCK

Roy A. Zangrando, Boonton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1984, Ser. No. 623,255
Int. Cl.[4] E05B *51/00*
U.S. Cl. 70—275 **2 Claims**

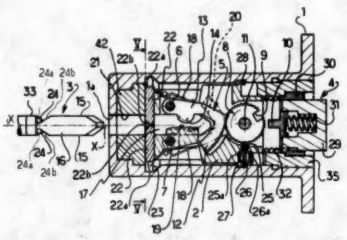


1. A highly secure structure for a secure area such as a weapons store, including an access security lock employing compressed nitrogen gas for controlling the bolt of a door to said secure structure, comprising: inside apparatus within said structure and remote from the vicinity of said door comprising a supply of compressed nitrogen gas, a logic device, a code reader with two reference keys therein; and, outside apparatus, outside of said structure and remote from said inside apparatus comprising an encoder receiving two removable unlocking keys in sequence, with a plurality of compressed gas pneumatic lines connecting the aforementioned inside and outside apparatus of said structure, all of said keys being coded by means of a pattern of holes and no-holes therein at fixed locations thereon to define a binary code, said encoder adapted to pneumatically read by means only of compressed gas passing through holes in said card or being blocked by said no-holes, the said binary codes on said two unlocking keys in sequence and converting the patterns thereon to pneumatic binary codes which are transmitted to said logic device via said pneumatic lines, said code reader being adapted to pneumatically read the said binary code patterns on said two reference keys in sequence and to transmit the pneumatic binary codes so as to read said logic device where they are sequentially compared to the codes received from said two unlocking keys, and means to produce a pneumatic output used for unbolting said door if the two said unlocking key codes match the two said reference key codes.

4,601,184
SAFETY LOCK

Gérard H. D. Doinel, Oustmarest par Ault, France, assignor to Fichet Bauche, France

Filed Sep. 10, 1984, Ser. No. 649,122
Claims priority, application France, Sep. 16, 1983, 83 14789; Sep. 16, 1983, 83 14790
Int. Cl.[4] E05B *29/06*
U.S. Cl. 70—360 **9 Claims**

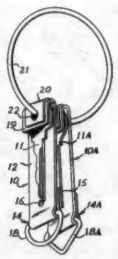


1. A safety lock of the type including a cylindrical body in which is axially and rotatably mounted a cylinder containing at least one pivoting member adapted to be actuated by a key and authorizing the operation of a lock mechanism by rotation of the cylinder in the cylindrical body after axial displacement of the said cylinder towards the said mechanism, characterized in that the said pivoting member has teeth and is in constant mesh with a toothed wheel which is loosely mounted on an axis pin transversely connected to the cylinder and which is provided with a notch opening onto the periphery of the said wheel and capable of positive driving connection with an element of the lock mechanism after the said notch is aligned with the said element and the said wheel is displaced towards the latter.

4,601,185
KEY IDENTIFIER

Richard F. Sheldon, 101 Almond Dr., Albany, Ga. 31705

Filed Feb. 19, 1985, Ser. No. 702,912
Int. Cl.[4] A44B *15/00*
U.S. Cl. 70—456 R **5 Claims**



1. In a key ring having a plurality of keys thereon, the combination therewith of a plurality of key locators, each key locator of said plurality of key locators being fixed to one key of said plurality of keys, each key locator including a flexible tab adjacent to a key, a unique identifier carried by said tab and extending beyond said key, said unique identifier being unique among said plurality of keys, and a clip for selectively holding said tab to said key, said key ring being receivable through holes defined in said tab and said clip.

4,601,186
PROCESS AND APPARATUS FOR ACHIEVING NARROW WORKPIECE TOLERANCES IN DROP-FORGING, ESPECIALLY IN ISOTHERMAL FORGING

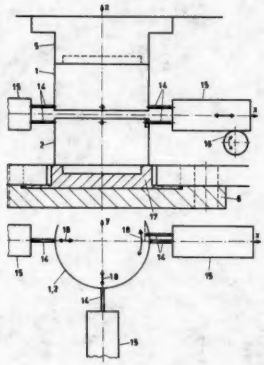
Roland Künzli, Mellingen, and Hans Rydstad, Birmenstorf, both of Switzerland, assignors to BBC Brown, Boveri & Co., Ltd., Baden, Switzerland

Filed Feb. 14, 1985, Ser. No. 701,519

Claims priority, application Switzerland, Mar. 2, 1984, 1035/84

Int. Cl.[4] B21D *72/00*

U.S. Cl. 72—21 4 Claims



1. A process for achieving narrow workpiece tolerances in drop-forging, especially in the isothermal forging of heat-resistant materials, where the two die halves (1, 2) representing the die, which are at the workpiece temperature or virtually at the workpiece temperature, experience a movement relative to one another under the influence of the press forces, in such a way that their position relative to one another diverges from the geometrical nominal value in the course of the pressing operation, wherein a first workpiece is introduced into a forging press between the die halves, wherein, according to a first step of the pressing operation, the position of the die halves (1, 2) relative to one another is measured by mechanical means (14, 15, 16) or physical means (10, 11, 12, 14), with the die halves (1, 2) closed, in an xy plane perpendicular to the direction z of the press force exerted and is evaluated via a computer and control unit (27, 28, 29, 30) located outside the forging press, wherein, in a second step, the forging press is temporarily relieved of pressure, the two die halves (1, 2) are separated from one another and the first workpiece is removed from the forging press, and wherein the position of the two die halves (1, 2) relative to one another is positively corrected by mechanical means (6, 17, 19, 20, 21; 6, 17, 21, 23, 24, 25, 26) according to the measurement result, a second workpiece is introduced into the forging press, and in a third process step the pressing operation is completed at one stroke, with the die halves (1, 2) in their corrected position, any cooling of the workpiece and die being avoided at the same time.

4,601,187
TWISTING APPARATUS AND METHOD

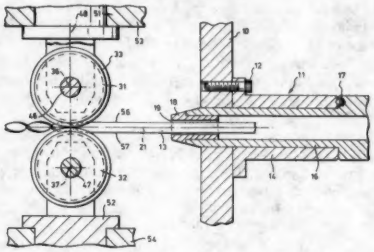
Frank Johnson, and Sidney D. Akehurst, both of Crowborough, Great Britain, assignors to The Wellform Engineering Company (Sussex) Limited

Filed May 14, 1984, Ser. No. 609,848

Claims priority, application United Kingdom, May 13, 1983, 8313162

Int. Cl.[4] B21B *15/02*

U.S. Cl. 72—64 12 Claims



1. Apparatus for twisting thin easily deformable strip material comprising: guide means for guiding a strip of material along a feed path in such a manner to retain the strip in a first plane as it passes said guide means, two roll means mounted adjacent said guide means for receiving strip directly from said guide means, means for rotatably driving at least one roll means, each roll means having groove means on its outer circumferential edge, the two roll means being spaced apart by a determined distance so that the respective groove means thereof engage opposite edges of the strip as it passes therebetween, the roll means being mounted so that their axes of rotation are twisted with respect to one another to cause the strip from the guide means to be driven forwards solely by said roll means and twisted without change of its cross section as it passes through said roll means to form a helically twisted strip.

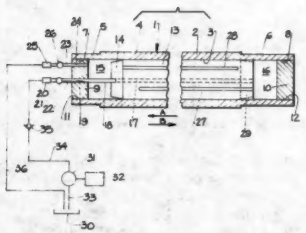
4,601,188
WORK ROLLS FOR A STRIP MILL HAVING ADJUSTABLE EDGE RELIEFS

Tadeusz Sendzimir, Weekeepeemee Rd., Woodbury, Conn. 06798

Filed Jun. 21, 1985, Ser. No. 747,660

Int. Cl.[4] B21B *27/02, 31/18*

U.S. Cl. 72—243 8 Claims



1. A work roll and a hydraulic system therefor for use in a roll backed cold strip mill said work roll having means within it for relief of the roll separating force at the strip edge, said work roll comprising a tubular body with a cylindrical roll face of uniform diameter terminating at its ends in neck portions of lesser diameter and having an axial bore of uniform diameter throughout, removable plugs mounted in and closing

in fluid tight fashion the ends of said tubular body, a cylindrical mandrel having a length equal to the length of said roll face, said mandrel being located within said tubular body and normally having an interference fit therein, said mandrel having a relief formed at one end, the remainder of said bore at either end of said mandrel defining first and second volumes, said hydraulic system comprising a first tube passing through one of said plugs in fluid-tight fashion and communicating with the adjacent one of said first and second volumes for the introduction therein of hydraulic fluid under pressure and removal therefrom of hydraulic fluid, said mandrel having an axial passage therethrough, a second tube for said work roll being attached to said mandrel and connected to said axial passage therein in a fluid-tight manner, said second tube extending through said same plug with a sliding fluid-tight fit, said second tube communicating with the other of said first and second volumes via said mandrel passage for the introduction therein of hydraulic fluid under pressure and removal therefrom of hydraulic fluid, and a valve means connected to each of said first and second tubes to open and close said first and second tubes, said hydraulic system introducing hydraulic fluid under pressure into one of said first and second volumes to convert said interference fit between said tubular body and said mandrel to a sliding fit to axially shift said mandrel to a desired position in said tubular body while removing hydraulic fluid from the other of said first and second volumes to prevent pressure build up therein, and thereafter reducing said hydraulic pressure in said one of said first and second volumes to atmospheric reinstating said interference fit, said second tube being axially shiftable with said mandrel.

4,601,189

METHOD OF AND TOOL FOR MITERING FRAME MEMBERS

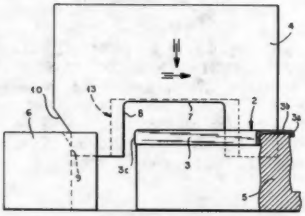
Christoph Langenhorst, Bad Sassendorf, Fed. Rep. of Germany, assignor to Walpat AG, Basel, Switzerland

Filed Aug. 9, 1984, Ser. No. 639,366

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328804

Int. Cl.⁴ B21D *28/00*

U.S. Cl. 72—326 **12 Claims**



7. A method of mitering a frame profile having a web in which a miter cut edge is to be formed at a miter angle to a longitudal edge of the profile and having a trim flange at a right angle to said web adapted to be formed with a rounded trim edge adjacent said miter edge, said method comprising the steps of:

feeding said profile at said miter angle along a cutting die having a cutting edge corresponding to said miter edge and a rounded portion adjacent said cutting edge against which said trim flange can be bent, toward the path of a vertically displaceable punch having a cutting edge cooperating with said cutting edge of said die to form said miter edge, and a vertical bending edge adjoining said cutting edge of said punch for bending said trim flange to form said trim edge; and

laterally guiding an inclined shoulder of said punch on a fixed guide engaging a lateral edge of said punch to impart a lateral movement to said punch and bring said bending edge to bear against said trim flange and bend the latter before said trim flange is severed from waste of said profile to form said trim edge.

4,601,190

DRAWING INSTALLATION IN A PRESS

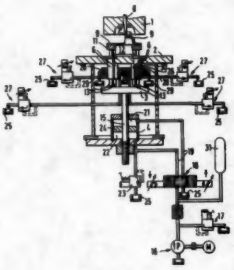
Franz Schneider, Goeppingen; Peter Pfeifle, Schorndorf, and Wolfgang Michael, Goeppingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Jun. 10, 1985, Ser. No. 743,080

Claims priority, application European Pat. Off., Jun. 29, 1984, 84107551.8

Int. Cl.⁴ B21D *22/00*

U.S. Cl. 72—347 **12 Claims**



1. A drawing installation in a press, comprising a press table, a pressure plate means adjustably supported in the press table, at least one pressure unit for moving the pressure plate means, support means, drawing work tool means, a number of pressure cylinder means cooperating with the pressure plate means and with the support means for holding the workpiece to be drawn on the drawing work tool means, the pressure cylinder means cooperating with the pressure plate means and with the support means being rigidly secured with their cylinder housing means in the press table for the operating condition, the pressure cylinder means including piston means extending on both sides out of the cylinder housing means by way of piston rods, said piston rods cooperating at one end with the support means and at the other end with the pressure plate means, the contact with the pressure plate causing the pressure cylinder means to hold the workpiece and control means including control valve means subsequently operable to change its through-flow cross section for separately controlling the cylinder space of each pressure cylinder means on the piston side opposite the support means.

4,601,191

OUTERRACE OF UNIVERSAL JOINT WITH CROSS GROOVES

Sadao Ikeda; Kunihiko Imahashi, and Yasuo Iwata, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 14, 1985, Ser. No. 711,650

Claims priority, application Japan, Apr. 18, 1984, 59-078094

Int. Cl.⁴ B21D *22/00*

U.S. Cl. 72—354 **1 Claim**

1. An apparatus for forging an outerrace of a universal joint having cross grooves, comprising:

a die and a vertically movable upper die;

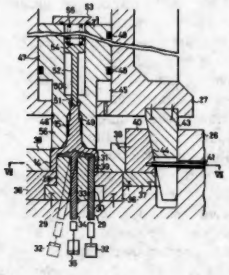
a mandrel punch fixed in said die and to be inserted into an element having generally an outerrace shape;

a plurality of cross groove molds being disposed on the outer circumference of said punch so that they can move up and down obliquely and being formed on their respective outer surfaces with molding faces corresponding to the cross grooves of said outerrace;

a knock-out extendable from said die to the upper face of said mandrel punch;

a backing mold being disposed above said mandrel punch and supported by said upper die so that it can be thrust downward and having on its lower end a molding face corresponding to the shaft portion of said outerrace;

a plurality of forming mold means being disposed surrounding said mandrel punch, so that said forming molds can



move toward and away from said punch, and forming molds having on their respective punch-side surfaces molding faces corresponding to the respective portions of the outer circumference of the cylindrical portion of said outerrace;

and press means for driving said forming molds toward the outer circumference of said mandrel punch to press said material when said upper die moves down.

4,601,192

METHOD OF PRODUCING AN EXPANSION SLEEVE FOR A METALLIC EXPANSION DOWEL ASSEMBLY

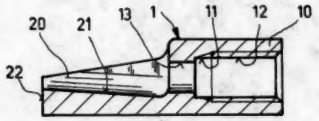
Gusztav Lang; Erich Leibhard, both of Munich, and Peter Froehlich, Neuried, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Filed Jan. 8, 1985, Ser. No. 689,666

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1984, 3400475

Int. Cl.[4] B21D *31/00*; B21K *1/76*

U.S. Cl. 72—377 **5 Claims**



1. Method of producing an axially elongated expansion sleeve for an expansion dowel assembly with the completed expansion sleeve having a first end and a second end spaced apart in the axial direction, said expansion sleeve comprising a cylindrically shaped axially extending receiving section extending from the first end toward the second end and having an axially extending bore extending from the first end, and an axially extending expansion section extending from the second end toward the first end and said expansion section being substantially U-shaped in cross-section transverse to the axial direction, said U-shaped section having a bight base and a pair of legs extending from said bight base, said base has a radially inner surface facing toward and spaced from the axis of said expansion sleeve and an oppositely facing radially outer surface spaced more remotely from the axis of said expansion sleeve than said radially inner surface, and said radially inner surface converges inwardly toward the axis in the direction extending toward the second end, comprising the steps of forming an axially extending rotationally symmetrical blank for forming the expansion sleeve with the blank having a first end and a second end corresponding to the expansion sleeve, deforming at least an axially extending part of the axially extending blank from the second end toward the first end into a U-shaped section extending from the second end toward and spaced from the first end with the U-shaped section having a uniform base thickness, upsetting the U-shaped section to increase the thickness of the base of the U-shaped section so that the thickness increases in the direction toward the second end, shaping the upset U-shaped section so that the radially outer surface thereof is cylindrically shaped for the extent thereof in the axial direction of the expansion sleeve and with the radially inner surface of said base converging toward the expansion sleeve axis in the direction toward the second end.

4,601,193

MEASURING CIRCUIT FOR IONIC CURRENT MEASUREMENT

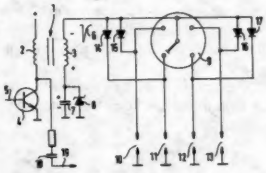
Reinhold Blauhut, and Boguslaw Maciejewski, both of Werdohl, Fed. Rep. of Germany, assignors to Atlas Fahrzeugtechnik GmbH, Werdohl, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,169

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339569

Int. Cl.[4] G01L *23/22*; G01N *27/70*

U.S. Cl. 73—35 **1 Claim**



1. A measuring circuit for ionic current measurement in the combustion chamber of an Otto engine comprising an ignition transformer the secondary coil of which supplies an ignition circuit and which, on the side carrying the positive voltage of the ignition pulse, is connected to ground and, on the side carrying the negative voltage of the ignition pulse, to the ignition spark gaps via a distributor, and further comprising inserted into the ignition circuit a parallel circuit of a high-voltage Zener diode connected in the non-conducting direction relative to the ignition current and of a capacitor as a measuring voltage source, characterized in that the parallel circuit is connected between the side carrying the positive voltage of the secondary coil and ground and that the secondary coil is connected via diodes immediately to the ignition spark gaps, whereby the anode of each diode is connected to the side of the secondary coil carrying the negative voltage of the ignition pulse and that a coupling capacitor for decoupling of an ionic current signal is coupled to the primary winding of the ignition transformer.

4,601,194

METHOD AND APPARATUS FOR LEAK TESTING OF PIPE

Ronnie F. Miller; Arthur L. Dwyer; Darwin A. Miller, and Darwin L. Miller, all of Houma, La., assignors to Damco Testers, Inc., Houma, La.

Continuation-in-part of Ser. No. 458,790, Jan. 18, 1983, abandoned. This application Jan. 18, 1984, Ser. No. 571,823

Int. Cl.[4] G01M *3/20*

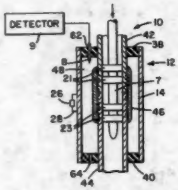
U.S. Cl. 73—40.7 **8 Claims**

1. A method of testing for leaks in oil field pipe at a rig floor by using a single source of pressurized test gas to actuate a testing tool positioned at a pipe test section and to pressurize the pipe test section to test for leaks, said method comprising:

(a) pressurizing a test gas comprising a mixture of a detectable quantity of helium tracer gas and a carrier gas in a ration of helium tracer gas to carrier gas greater than 1:9 by volume to a pressure of at least 3000 psi to provide said single source of pressurized test gas;

(b) enclosing an area around the outside of the pipe to define a chamber around the pipe test section to confine a test gas therewithin;

(c) actuating the test tool by introducing said pressurized test gas having a ratio of helium tracer gas to carrier gas greater than 1:9 by volume and at a pressure of at least



3000 psi from said single source of pressurized test gas into the test tool to seal off an internal section of pipe to form a closed volume pipe test section;

(d) introducing said pressurized test gas from said single source of pressurized test gas at substantially the same ratio of helium tracer gas to carrier gas greater than 1:9 by volume and at substantially the same pressure of at least about 3000 psi as sued to actuate said test tool into said pipe test section; and

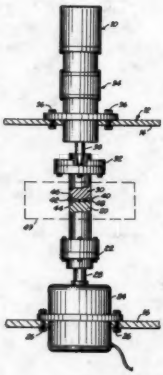
(e) sensing the presence of leaking helium tracer gas in the chamber around the outside of the pipe test section with a sensing means.

4,601,195

APPARATUS AND METHOD FOR MEASURING VISCOELASTIC PROPERTIES OF MATERIALS

Ronald F. Garritano, Flemington, N.J., assignor to Rheometrics, Inc., Piscataway, N.J.

Filed Apr. 11, 1985, Ser. No. 722,150
Int. Cl.[4] G01N *11/00*
U.S. Cl. 73—60 **23 Claims**



1. Apparatus for measuring the viscous component and the elastic component of forces within a viscoelastic test specimen placed in shear, the test specimen being coupled to a platen having a rest position, the platen being displaceable from the rest position rotationally and axially relative to a fixed axis in response to rotational and axial forces exerted by the test specimen upon the platen as a result of said viscous component and said elastic component, the apparatus comprising:

a first transducer coupled with the platen for applying a rotational counterforce to the platen for biasing the platen toward the rest position;

a first detector for detecting rotational movement of the platen away from the rest position;

first drive means for actuating the first transducer in response to the first detector to balance the rotational force exerted by the test specimen upon the platen with the rotational counterforce exerted by the first transducer upon the platen and maintain the platen at the rest position;

first indicating means for indicating the magnitude of the rotational counterforce;

a second transducer coupled with the platen for applying an axial counterforce to the platen for biasing the platen toward the rest position;

a second detector for detecting axial movement of the platen away from the rest position;

second drive means for actuating the second transducer in response to the second detector to balance the axial force exerted by the test specimen upon the platen with the axial counterforce exerted by the second transducer upon the platen and maintain the platen at the rest position; and

second indicating means for indicating the magnitude of the axial counterforce;

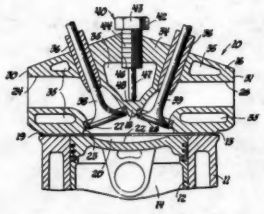
whereby the first indicating means provides a measure of the viscous component of forces within the test specimen and the second indicating means provides a measure of the elastic component of forces within the test specimen when the platen is at the rest position.

4,601,196

ENGINE COMBUSTION CHAMBER PRESSURE SENSOR

Arthur R. Frelund, Okemos, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1984, Ser. No. 640,937
Int. Cl.[4] G01L *23/22*
U.S. Cl. 73—115 **11 Claims**



1. An internal combustion engine having at least one combustion chamber and comprising, in combination,

a housing component including spaced first and second walls, said first wall substantially defining at least one side of the combustion chamber and being resiliently yieldable in response to varying pressure therein and said second wall being relatively rigid and located away from direct exposure to combustion chamber pressure, and the improvement comprising

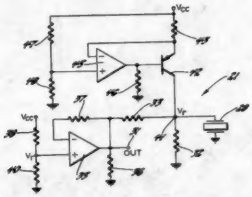
a sensor including a supporting body and a probe movable relative to the body to provide a readable signal for indicating and control functions, and

means securing the body to one of the housing walls with the probe engaging the other of said walls such that relative motion of the walls due to pressure variations in the combustion chamber will directly cause signal generating motion of the probe relative to the sensor body.

4,601,197
PEAK COMBUSTION PRESSURE TIMING DETECTOR FOR INTERNAL COMBUSTION ENGINE

Gerald T. Fattic; David S. Dennis, and William J. Ricketts, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 12, 1985, Ser. No. 754,431
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.3 **3 Claims**



1. Apparatus for sensing the timing of peak combustion pressure in the combustion chamber of an internal combustion engine comprising, in combination:

pressure sensing apparatus including a piezoelectric element adapted for flexure in response to variations in combustion chamber pressure, the piezoelectric element having a capacitance varying with said flexure;

a first resistance connected electrically in parallel with the capacitance of the piezoelectric element with grounded and ungrounded junctions;

constant current generating means adapted to supply a constant current to the ungrounded junction, the constant current being effective, when the capacitance remains constant, to establish a predetermined voltage across the first resistance and thereby across the capacitance;

a second resistance;

a reference voltage source effective to provide the predetermined voltage;

an operational amplifier having an output connected through the second resistance to the ungrounded junction and through a third resistance to the grounded junction, an inverting input connected to the output through a feedback resistance and a non-inverting input connected to the reference voltage source, the operational amplifier thus comprising a variable current source and sink effective to maintain the predetermined voltage on the capacitance; and

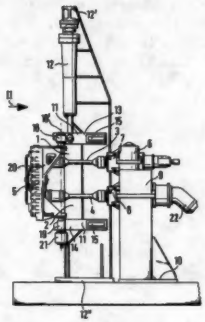
output circuit means connected to the output of the operational amplifier, the voltage thereon corresponding to the derivative of the pressure sensed by the piezoelectric element and thus indicating the timing of peak combustion pressure as it passes through the predetermined voltage.

4,601,198
TORSIONAL TEST STAND

Jörg Kolitsch, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,469
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410702
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118 **18 Claims**

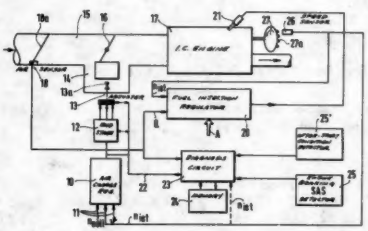
1. A torquing test stand for shafts, comprising test circuit means including two parallel test sections for shafts to be tested and closed by reversing gear means for applying opposite torques to said shafts, torquing clutch means for each test section, a respective shaft being subjected to a torque superimposed on a rotary movement by the torquing clutch means, and further means for producing an additional test load of a respective shaft end, the torques produced in the test sections being substantially equal and the test loads being produced by means of one of said reversing gear means which is movably supported at a predetermined distance from the other reversing gear means.



4,601,199
METHOD AND DEVICE FOR SELF-DIAGNOSIS OF FINAL SETTING MEMBERS

Helmut Denz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 754,514
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3428620; Sep. 27, 1984, 3435465
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118 **11 Claims**



1. A method of self-diagnosis of a setting member pertaining to one subsystem of a complex regulating system including additional subsystems, particularly for use in an internal combustion engine, comprising the steps of actuating, during normal operation of the system, the setting member at a predetermined time point at which a regulating path governed by the one subsystem does not react to a change of the setting member, and simultaneously measuring an actual signal from an additional subsystem which only indirectly affects said setting member; then comparing plausibility of changes of the setting member and of the signal from the additional subsystem, with a set of data stored in a memory, said data containing a correlation of respective stages of the setting member to the measured changes of the signal from additional subsystems.

4,601,200
MEASURING APPARATUS

Eduardus Stoffelen, Brasschaat, Belgium, assignor to Elektriciteit voor Goederenbehandeling Marine en Industrie, in het verkort: "Egemin", naamloze vennootschap, Schoten, Belgium

Filed May 31, 1983, Ser. No. 499,518
Claims priority, application Luxembourg, Jun. 7, 1982, 84185
Int. Cl.[4] G01F *23/28*; G01N *9/00, 11/16*
U.S. Cl. 73—290 V 26 Claims

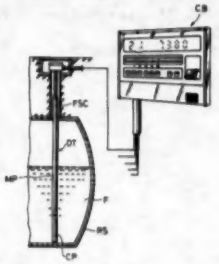
1. Measuring apparatus, comprising:
a measuring device;
a measuring element secured at a first end to said measuring device;
a measuring body secured to a second free end of said measuring element;
a pendulum means capable of modulating oscillations of said measuring element, said pendulum means being responsive to a tension in said measuring element induced by said measuring body;
means for actuating said measuring device;
means for actuating said pendulum; and
means for interpreting the oscillations of said measuring element.

4,601,201
LIQUID LEVEL AND QUANTITY MEASURING APPARATUS

Yasuto Oota, and Makoto Shimizu, both of Tokyo, Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,165
Claims priority, application Japan, Mar. 14, 1984, 59-48491; Mar. 14, 1984, 59-48492
Int. Cl.[4] G01F *23/26*; G01R *27/26*
U.S. Cl. 73—304 C 20 Claims

1. Apparatus for measuring the level and amount of at least one liquid in a tank comprising an electrode probe having a pair of electrode means, one of said electrode means comprising two rows of spaced segmented electrodes with the segmented electrodes in one row being longitudinally offset relative to the segmented electrodes in the other row to provide an overlapping relationship between the segmented electrodes in the two rows, the other of said electrode means comprising an elongated electrode disposed in opposing relationship to said segmented electrodes to form a corresponding number of capacitors, means for supplying a voltage of high frequency to said segmented electrodes and said elongated electrode to generate electrical signals corresponding to the electrostatic capacity of each of said capacitors, converting means for converting said electrostatic capacity into a frequency signal, comparing means for comparing the signal frequency of said capacitors formed by said segmented electrodes to thereby detect where the liquid level lies on the segmented electrodes,

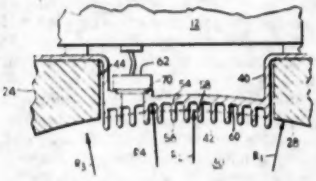


and calculating means for calculating the quantity of liquid in said tank based on said detected liquid level.

4,601,202
GAS TURBINE ENGINE COMPONENT COOLING SYSTEM

Michael E. Colman, Wakefield, and Robert E. Goeller, Beverly, both of Mass., assignors to General Electric Company, Lynn, Mass.

Division of Ser. No. 565,942, Dec. 27, 1983. This application Mar. 15, 1985, Ser. No. 695,334
Int. Cl.[4] G01L *19/14*
U.S. Cl. 73—431 17 Claims



1. An electronic control apparatus poitionable in a cooling fluid environment comprising:
a housing for containing an electronic control having an outer surface;
a plurality of heat transfer fins extending from said outer surface of said housing and positionable in said cooling fluid environment for cooling said fins and housing;
environmental sensor means disposed in and connected to said housing adjacent to said heat transfer fins and being connectible to said electronic control; and
said sensor means being positioned in said housing in flow communication with said cooling fluid flowable over said fins for sensing a characteristic of primarily said cooling fluid environment.

4,601,203
OXYGEN CONTENT SAMPLING SYSTEM

Robert A. Levine; Danny F. Davis, both of Westminster, and Anthony W. Cordeiro, Huntington Beach, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 1, 1985, Ser. No. 751,242
Int. Cl.[4] G01N *27/00*
U.S. Cl. 73—432 R 4 Claims

1. An oxygen content sampling system comprising, in combination:
a housing including a substantially cylindrical, elongated

sleeve, a collar secured at one end of said substantially cylindrical, elongated sleeve and defining a passageway therethrough, and a threaded cap secured to said collar and extending beyond said substantially cylindrical, elongated sleeve;

an oxygen probe for sensing an oxygen content and issuing an oxygen content signal;

a weighted cable extending from said oxygen probe through said passageway in said collar for transmission of said

oxygen content signal, said weighted cable including thereon a series of length markings; and

an oxygen monitor interconnected to said weighted cable for receipt of said oxygen content signal, said oxygen monitor issuing an alert whenever said oxygen content at said oxygen probe exceeds a predetermined threshold;

said substantially cylindrical, elongated sleeve being adapted to receive, contain, and protect said oxygen probe during periods of non-use.

4,601,204

APPARATUS WITH MEANS OF SELF-DISPLACEMENT FOR ITS ADVANCE WITHIN A DUCT, IN PARTICULAR FOR REMOTE INSPECTION AND/OR TREATMENT AND/OR TUBING OF SAID DUCT

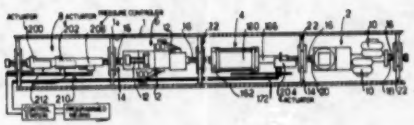
Bernard Fournot, Elbeuf; Francois Le Bozec, Le Mesnil Esnard, and Daniel Rouland, 11-13 rue des Capucins, 76000 Rouen, all of France, assignors to Daniel Rouland and Gaz de France, both of, France

Filed Sep. 20, 1984, Ser. No. 652,605

Claims priority, application France, Sep. 23, 1983, 83 15163

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—432 R **27 Claims**



1. An apparatus with self-displacement means for its advance in the interior of a duct notably for remote inspection or treatment of the duct, comprising a plurality of elements coupled to one another so as to make up a train, each element of which constitutes a wagon independent of the other elements and being interchangeable at will, each said element performing a definite function and being of a length adapted for any curves to be taken, at least one of said elements constituting a displacing element, at least one other of said elements constituting an operating element for operating said displacing element, said elements being coupled to one another by flexible linking means, said flexible linking means being provided with sliding and centering bearing means so that the apparatus is adapted to pass any curve.

4,601,205

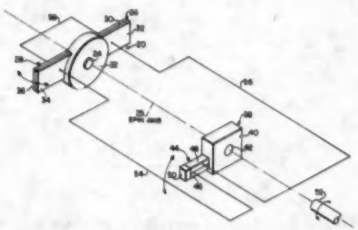
LINEAR ACCELERATION COMPENSATION FOR MULTISENSOR

Roland Pittman, Montclair, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Nov. 19, 1984, Ser. No. 672,560

Int. Cl.[4] G01P *15/09*

U.S. Cl. 73—505 **7 Claims**



1. A compensated angular velocity sensing device comprising:

a first section, including:

(a) a hub coaxial with a spin axis;

(b) at least one pair of piezoelectric bendable crystal members extending radially outwardly from the hub for generating a composite signal, including a desired component corresponding to angular velocity about the spin axis and an undesired component relating to linear acceleration;

a second section, including:

(c) a central body coaxial with the spin axis;

(d) a third piezoelectric bendable crystal member extending outwardly from the central body for developing a signal corresponding to linear acceleration;

(e) wires interconnecting the three crystal bendable members for bucking out the effects of linear acceleration;

(f) means mounting the first and second sections in coaxial spaced coupled relation wherein the third crystal member is adjustably angularly positioned relative to the pair of crystal members for adjusting the phase of the second section signal; and

(g) adjustable weight means connected to an outer end of the third bendable crystal member for determining the amplitude of the signal obtained from the third bendable crystal member.

4,601,206

ACCELEROMETER SYSTEM

Norman F. Watson, South Queensferry, Scotland, assignor to Ferranti plc, Cheshire, England

Filed Sep. 14, 1984, Ser. No. 650,648

Claims priority, application United Kingdom, Sep. 16, 1983, 8324856

Int. Cl.[4] G01P *15/00*

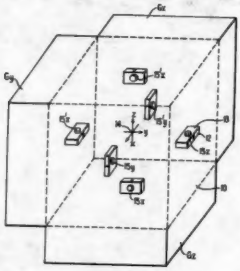
U.S. Cl. 73—514 **14 Claims**

1. An inertial platform accelerometer cluster having three orthogonal axes, said accelerometer cluster comprising an accelerometer system associated with each of the three orthogonal axes, each accelerometer system including:

at least one means for sensing inertial accelerations, said means for sensing inertial accelerations being responsive to accelerations in a frequency range extending down to zero Hertz;

a pair of means for sensing vibrational accelerations, each of said means for sensing vibrational accelerations being

responsive to vibrational acceleration in a range of relatively higher frequencies causing coning and sculling effects in the inertial accelerometers of said cluster, said pair of means for sensing vibrational accelerations being disposed equidistantly about a centre of percussion common to the other orthogonal axes and the centre of gravity of the cluster; and



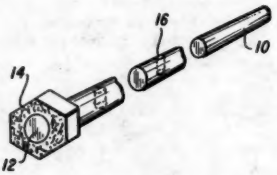
signal processing means operable to produce from the sum of the signals from said pair of means for sensing vibrational accelerations a sum signal representative of vibrational acceleration of the cluster along said axis and operable to produce from the difference between the signals from said pair of means for sensing vibrational accelerations a difference signal representative of the angular acceleration of the cluster about one of said orthogonal axes.

4,601,207

MEASURING MINE ROOF BOLT STRAINS

Bernard J. Steblay, Lakewood, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 11, 1985, Ser. No. 690,810
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—597 **15 Claims**



1. A method of measuring the strain in mine roof bolts comprising the steps of:

machining a flat portion on the head of the bolt before loading;

drilling a reflector hole radially through the diameter of the bolt at a predetermined distance from the bolt head before loading, the ratio of the diameter of the hole to the diameter of the bolt being less than 0.10 to prevent weakening of the loaded bolt;

generating an ultrasonic pulse at the flat portion after loading;

measuring the time of travel of the ultrasonic pulse reflected from the hole, which increases as the bolt is loaded; and

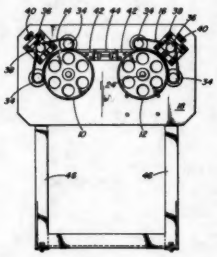
correlating the time measurement of the strain in the bolt.

4,601,208

OPTICAL FIBER PROOF TESTING EQUIPMENT

Glen McKay; Henry F. Smith; Ronald W. Price, all of Saskatoon, and Firoz A. Keshavjee, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 11, 1985, Ser. No. 700,436
Claims priority, application Canada, May 18, 1984, 454762
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—829 **9 Claims**



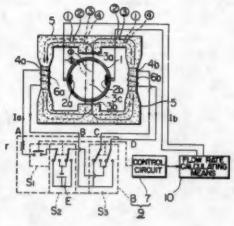
1. An optical fiber proof testing equipment comprising a drive means, first and second pulleys directly coupled to the drive means, first resilient means for bearing down on a fiber located between the first resilient means and the pulley over part of the circumference of the first pulley to fix the fiber against that circumferential part of the first pulley, second resilient means for bearing down on a fiber located between the second resilient means and the second pulley over part of the circumference of the second pulley to fix the fiber against that circumferential part of the second pulley, guide means for guiding the fiber from the first pulley part to the second pulley part, the second pulley being larger in diameter than the first pulley.

4,601,209

ELECTROMAGNETIC FLOWMETER OF THE RESIDUAL MAGNETISM TYPE

Yoshitaka Amata, Yokkaichi, Japan, assignor to Aichi Tokei Denki Co., Ltd., Aichi, Japan

Filed Apr. 12, 1985, Ser. No. 722,537
Claims priority, application Japan, May 16, 1984, 59-98207
Int. Cl.[4] G01F *1/60*
U.S. Cl. 73—861.17 **8 Claims**



1. A residual magnetism type electromagnetic flowmeter comprising:

a pair of electrodes disposed to face a flow of an electrically conductive fluid passing through a pipe made of a non-magnetic and electrically non-conductive material, said electrodes being separated from each other in direction intersecting said flow;

a magnetic circuit including a pair of magnetic poles, a magnetic flux gap formed between said pair of magnetic

poles such that magnetic flux passes through said magnetic flux gap while intersecting imaginary lines connecting said pair of electrodes with each other as well as intersecting said flow, and a pair of retentivity portions made identically with each other and disposed magnetically parallel or serially with each other but each connected magnetically serially with said magnetic flux gap, said retentivity portions being arranged such that residual magnetism remains upon removing a magnetic field exerted thereon to magnetize said portions;

a pair of exciting coils arranged to be identical with each other and to be electromagnetically coupled individually respectively with said retentivity portions;

an excitation control means for performing identical short duration current conductions simultaneously intermittently through said respective exciting coils, and for controlling the respective directions of the current conduction such that the respective polarities of the magnetic fluxes appearing at said magnetic flux gap respectively due to the magnetization of each said retentivity portions by the intermittent current conductions change through predetermined states repeatedly in a predetermined order such that the respective polarities of the magnetic flux appearing at said magnetic flux gap are opposite to each other, are identical with each other in one polarity, are opposite to each other, and are identical with each other in the other polarity, and

a flow rate calculating means for successively obtaining values of sampled voltage each of which is a value of a portion of an output voltage appearing between said electrodes in a predetermined period which is set to occur in a predetermined period of time after the completion of every current conduction by said excitation control means and before initiation of the next current conduction, and for calculating the flow rate of said fluid on the basis of differences obtained by subtracting a value of said sampling voltage obtained in the state where said respective polarities of said magnetic flux at said magnetic gap are opposite to each other from a value of said sampling voltage obtained in the immediately succeeding state where said respective polarities of said magnetic flux are identical with each other in the one or the other polarity.

7. A transducer for an ultrasonic flowmeter of the upstream-downstream type comprising,

a hollow tubular housing closed at a first end, the housing having a central lengthwise axis, and

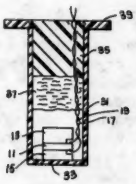
a piezoelectric crystal having opposed major sides, with first and second acoustic impedance loading members joined to said opposed major sides of the crystal forming a sandwich, wherein one of said loading members has a thickness of approximately one-half of a wavelength of said radial mode vibration and the other of said loading members has a thickness of approximately one-quarter of the same wavelength, the loading members having dimensions forcing radial mode vibration from the crystal, said sandwich disposed against said first end, with the major sides of the crystal disposed generally perpendicular to the axis of the housing.

4,601,210

FLOWMETER WITH RADIAL VIBRATIONAL MODE FOR ULTRASONIC WAVES

Alvin E. Brown, Santa Cruz, Calif., assignor to Manning Technologies, Inc., Scotts Valley, Calif.

Filed May 1, 1984, Ser. No. 605,868
Int. Cl.[4] G01F *1/66*
U.S. Cl. 73—861.27 **9 Claims**



1. A method of operating an ultrasonic flowmeter for viscous fluids comprising,

transmitting and receiving ultrasonic acoustic waves generated by a piezoelectric crystal in upstream-downstream transducers of an ultrasonic flowmeter, said crystal having a radial vibrational mode,

enhancing radial mode vibration while damping compressional mode vibration, and

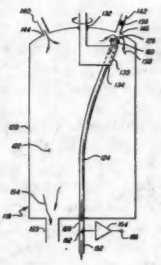
determining flow rate from said acoustic waves of radial vibrational mode.

4,601,211

MULTI-PORT VALVE IN A GAS COLLECTION SYSTEM AND METHOD OF USING SAME

Wayne J. Whistler, Glendora, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 12, 1984, Ser. No. 680,689
Int. Cl.[4] G01N *1/26, 1/24, 1/20, 1/14*
U.S. Cl. 73—863.33 **9 Claims**



1. A multi-port valve comprising:

a valve body;

a plurality of means for channeling gases into said valve body;

means for intercepting gases from said plurality of means for channeling, said means for intercepting having an entrance opening which is movable to select between each of said means for channeling, by moving said opening to intercept gases substantially exclusively from said selected means for channeling, said means for intercepting having an outlet for said intercepted gases;

means for moving said means for intercepting into selective alignment with each of said plurality of means for channeling to intercept gases therefrom;

wherein said means for channeling comprise inlet ports in said valve body;

wherein said means for intercepting gases comprises a sample tube pivotably mounted inside said valve body to move between said inlet ports;

wherein said means for moving comprises:

a sample tube guide mounted in said valve body and coupled to move said sample tube; and

means for actuating said sample tube guide;

a position detector for detecting the position of said sample tube guide and to indicate the alignment of said sample tube with each of said inlet ports; and

wherein said sample guide has a magnet attached thereto, and wherein said position detector comprises a plurality of magnetic field detecting Hall effect devices positioned on said valve body to detect the position of said magnet.

4,601,212

PRECISION MICROPIPETTOR

Justin J. Shapiro, C/O Lab Industries, 620 Hearst Ave., Berkeley, Calif. 94710

Filed Jul. 26, 1985, Ser. No. 759,190
Int. Cl.[4] G01N 1/14
U.S. Cl. 73—864.18 11 Claims

1. A precision micropipettor device, primarily useful for dispensing a predetermined, accurate, fixed volume quantity of fluid, comprising:

tubular fluid holding means having a longitudinal axis, a dispensing end and a working end;

a removable fluid outlet conduit means secured to said dispensing and;

a plunger shaft assembly having a first portion and a second portion, said first portion being disposed within said tubular fluid holding means and having a plunger at the end thereof, said second portion projecting outwardly from said working end of said tubular fluid holding means, said plunger shaft assembly being adapted for reciprocal motion within said tubular fluid holding means;

spring means surrounding said second portion of said plunger shaft assembly for biasly returning said plunger shaft assembly to a desired and predetermined resting position after said plunger shaft has dispensed fluid from said tubular fluid holding means and said fluid outlet conduit means;

control means, extending at least perpendicular to said longitudinal axis of said tubular fluid holding means, for predetermining the range of movements of said plunger shaft assembly in the direction of the longitudinal axis of said tubular fluid holding means, said control means including a recessed region provided on said plunger shaft assembly, said recessed region having an upper shoulder and a lower shoulder, said upper shoulder defining a first stop means and said lower shoulder defining a second stop means, and stop pin means secured to extend horizontally across said tubular fluid holding means and perpendicular to the longitudinal axis of said tubular fluid holding means, said stop pin means being received normally through said recessed region, said first stop means limiting the movement of said plunger shaft assembly in the downward longitudinal direction when said stop pin means abuts said first stop means, and said second stop means limiting the movement of said plunger shaft assembly in the upward longitudinal direction when said stop pin means abuts said second stop means,

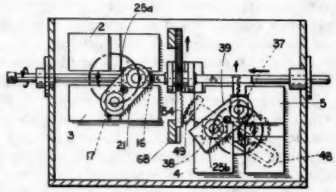
wherein said control means for predetermining the range of movements of said plunger shaft assembly in the direction of the longitudinal axis of said tubular fluid holding means permits said micropipettor device to repeatedly dispense an accurate predetermined quantity of fluid.

4,601,213

MECHANISM TO RECIPROCATE AND ROTATE A RAM

Charles R. Kimball, 250 S. Xenia St., Enon, Ohio 45323

Filed Apr. 30, 1984, Ser. No. 605,687
Int. Cl.[4] F16H 21/02; B65H 81/06
U.S. Cl. 74—23 12 Claims



1. Apparatus for causing oscillating movement of a ram including a reciprocating stroke and rotational movement of the ram near the ends of ram stroke comprising:

(a) an elongated ram;

(b) first and second support blocks each containing a pair of perpendicular arranged ways;

(c) a sliding block mounted for reciprocating sliding movement in each of said ways;

(d) an elongated tie arm pivotally connecting the sliding blocks of each support block;

(e) means for synchronously driving said tie arms so as to cause timed reciprocating motion of said sliding blocks, each of said tie arms including spaced means pivotally connecting said tie arm to each of the associated sliding blocks and pivot means positioned between said pivotally connecting means;

(f) a drive crank associated with each of said tie arms and having eccentrically mounted means rotatably mounted to said pivot means;

(g) means for synchronously rotating said drive cranks;

(h) first connecting means associated with one of the sliding blocks of said first support block for causing reciprocating movement of the ram; and

(i) second connecting means associated with one of the sliding blocks of said second support block for causing rotational motion of said ram near the ends of ram reciprocating travel, said second connecting means further comprising

(i) and elongated toothed rack fixedly secured to said one sliding block,

(ii) a rotatably mounted spur gear meshingly engaging said rack,

(iii) an elongated pivotally mounted pinion arm drivingly connected to said spur gear at one end and terminating at its opposite end in pinion gear means,

(iv) rack gear means mounted for reciprocating motion and meshingly engaging said pinion gear means, and

(v) sleeve gear means slidingly and rotatably connected to said ram and meshingly engaging said rack gear means, whereby reciprocating motion of said one sliding block causes rotational movement of said ram over a portion at least of its reciprocating travel.

4,601,214

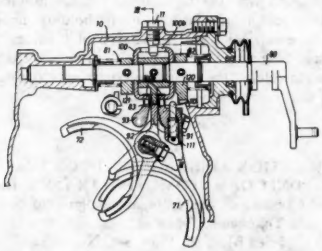
GEAR-SHIFT MECHANISM FOR MANUAL TRANSMISSION

Hisashi Fukuchi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 27, 1984, Ser. No. 675,224
Claims priority, application Japan, Nov. 29, 1983, 58-184135[U]
Int. Cl.[4] G05G 5/10, 9/12; B60K 41/26
U.S. Cl. 74—477 6 Claims

1. In a gear-shift mechanism for a manual transmission com-

prising a housing for said transmission; a movable shaft mounted in place within said housing for both axial and rotary movements and being operatively connected to a manual shift lever to be axially shifted from its neutral position to a forward or reverse position in selecting operation of said manual shift lever and to be rotated at its shifted position in shifting operation of said manual shift lever; a shift-and-select lever fixed to an intermediate portion of said movable shaft; an interlock member rotatably mounted in place on said movable shaft and having a pair of interlock arms located at the opposite sides of said shift-and-select lever; means for restricting rotary movement of said interlock member and permitting axial movement of the same; a pair of resilient means for centering said movable shaft to retain said shift-and-select lever and said interlock member in their neutral positions; and first, second and third shift heads arranged in sequence within said housing, said first and second shift heads each being operatively connected to first and second synchronizers respectively for establishing first and second speed gear trains and for establishing third and fourth speed gear trains, said third shift head being operatively connected to a shift fork for establishing a reverse gear train, and each of said shift heads being integrally formed with a pair of projections to be brought into engagement with said shift-and-select lever; and in which said shift-and-select lever is engaged in its neutral position with the projections of said second shift head such that said interlock arms are respectively



in engagement with the projections of said first and third shift heads to retain them in their neutral positions;

the improvement wherein said gear-shift mechanism comprises:

a cam member fixed to said movable shaft at one side of said interlock member; and

a spring loaded cam follower element assembled within said first shift head and being positioned to engage a cam face of said cam member when said movable shaft is shifted to the reverse position against one of said resilient means to effect engagement of said shift-and-select lever with the projections of said third shift head, said cam follower element being arranged to disengage from the cam face of said cam member after said movable shaft is rotated at its reverse position to effect shift movement of said third shift head for establishment of said reverse gear train; and

wherein one of said interlock arms is formed at one side thereof with a recess which is positioned to permit slight shift movement of said first shift head caused by engagment of said cam follower element with the cam face of said cam member during the shift movement of said third shift head, whereby said first synchronizer is temporarily operated in response to the slight shift movement of said first shift head to effect synchronous rotation of input and output shafts of said transmission prior to establishment of said reverse gear train.

4,601,215

STEERING WHEEL SHAFT FOR A MOTOR VEHICLE STEERING COLUMN

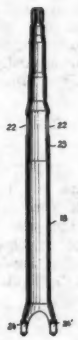
Jean-Pierre Barnabe; Michel Clerc, both of Valentigney, and Frédéric Mouhot, Voujeaucourt, all of France, assignors to Cycles Peugeot, Valentigney, France

Filed Apr. 16, 1984, Ser. No. 600,715

Claims priority, application France, Apr. 15, 1983, 83 06232

Int. Cl.[4] B62D *1/16*

U.S. Cl. 74—492 **8 Claims**



1. A steering wheel shaft for a motor vehicle steering column, said shaft comprising a tube in a single piece which has a wall thickness and an outside diameter which vary along the length of the tube and which includes a main body portion of given outside diameter, an enlarged end portion constituting a universal joint yoke, a narrow end portion for fixing a steering wheel, and at least one slot constituting a locking keeper in an intermediate portion between said main body portion and said narrow end portion.

4,601,216

REDUCTION GEAR

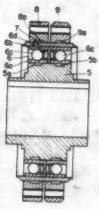
Toshitsugu Inoue, Kyoto; Hiromasa Ishihara, Hirakata, and Masato Morimoto, Shijyonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP82/00236, § 371 Date Feb. 16, 1984, § 102(e) Date Feb. 16, 1984, PCT Pub. No. WO84/00056, PCT Pub. Date Jan. 5, 1984

PCT Filed Jun. 18, 1982, Ser. No. 584,437

Int. Cl.[4] F16H *35/00, 1/28*

U.S. Cl. 74—640 **5 Claims**



1. A reduction gear comprising a first circular spline having a central axis of rotation and including first internal teeth having a true circular pitch circle, a second circular spline coaxial with and axially adjacent to said first circular spline and including second internal teeth having a true circular pitch circle, the number of said second internal teeth differing by an even number from the number of said first internal teeth, a flex

spline having external teeth which partially mesh with a each internal tooth of said first and second circular splines at positions symmetrical to said central axis of rotation and which is radially deformable, a wave generator having a nearly elliptical cross section, inside said flex spline and coaxial with said first and second circular splines, and a bearing, including an inner ring in contact with the external circumference of said wave generator, an outer ring and balls placed therebetween, said bearing being disposed between the internal circumference of said flex spline and the external circumference of said wave generator and being radially deformable, said flex spline being rotatable on said outer ring relative to said first and second circular splines, said inner ring and said balls, said wave generator having a ring shape notch in the peripheral surface thereof, said notch being axially aligned with said balls of said bearing such that said inner ring is radially deformable into said notch.

4,601,217

POWER DIVIDING DIFFERENTIAL

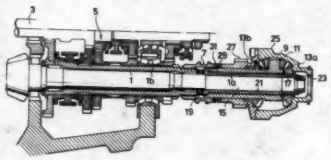
Masao Terasoka, Sano, and Toshio Kobayashi, Ota, both of Japan, assignors to Tochigifuji Kabushiki Kaisha and Fuji Heavy Industries, Ltd., both of Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,823

Claims priority, application Japan, Jan. 26, 1984, 59-10951

Int. Cl.[4] F16H *37/08, 37/06*

U.S. Cl. 74—701 **3 Claims**



1. A power dividing differential comprising: a hollow shaft for receiving input from a drive device; said hollow shaft comprising input and output side sections separated from each other; a pinion shaft provided on the output side of the hollow shaft; a pinion gear rotatably supported by the pinion shaft; a pair of side gears meshed with the pinion gear; a front wheel drive shaft passing through the axis of the said hollow shaft and coupled integrally operatively to one of said side gears; a differential case integrally connected with the other of said side gears and containing said pinion shaft, pinion gear and side gears, and from which power can be taken; a sleeve provided to operatively connect said input side section of said hollow shaft with said output side section thereof; and an engagement section for differential locking provided between said sleeve and said differential case such that said sleeve and said differential case can be engaged and disengaged by motion of said sleeve.

4,601,218

GEARING UNITS FOR USE WITH MINING APPARATUS

Werner Bohle, Lüdinghausen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

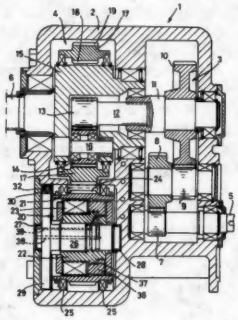
Filed Jun. 20, 1984, Ser. No. 622,733

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323250

Int. Cl.[4] F16H *3/44;* F16D *7/02*

U.S. Cl. 74—785 **13 Claims**

1. A drive unit for use with mineral mining apparatus; said unit comprising a housing, an input shaft extending into the housing, an output shaft extending into the housing, gearing at least including planetary gearing, within the housing drivably interconnecting the input shaft to the output shaft, a rotatable component of the planetary gearing which when held stationary permits drive to be transmitted through the gearing and when released to rotate interrupts the drive, brake means for selectively holding the rotatable component of the planetary gearing stationary, said brake means being composed of a first plate carrier and a second plate carrier, biasing means for causing the plates of the carriers to engage one another to rotatably lock the carriers together, a pressure chamber for receiving hydraulic fluid used to oppose the biasing means and to disengage the plates of the carriers, a toothed coupling



drivably interconnecting the first plate carrier to the rotatable component of the planetary gearing, holding means for holding the second plate carrier stationary in relation to said housing, a load sensor incorporated in the holding means for providing an electrical signal indicative of loading, and means responsive to said signal to provide fluid to flow to the pressure chamber to release the rotatable component of the planetary gearing in the event of overloading.

4,601,219

LUBRICATION ARRANGEMENT FOR FINAL GEAR UNIT OF AUTOMOTIVE TRANSAXLE

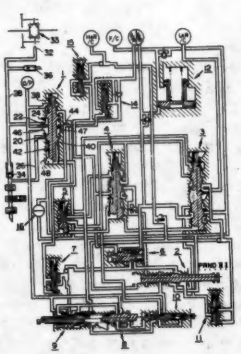
Kazuyoshi Iwanaga, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 30, 1984, Ser. No. 595,396

Claims priority, application Japan, Jul. 8, 1983, 58-123441

Int. Cl.[4] B60K *41/00*

U.S. Cl. 74—867 **2 Claims**



1. In a transmission including a torque converter and a final drive unit integrated with a transmission gear train,

(a) a hydraulic control system for controlling the operation of said transmission and which includes

(i) a pump for discharging hydraulic fluid under pressure, and

(ii) a pressure regulator valve for controlling the pressure of hydraulic fluid fed to said control system by controllably draining some of the fluid discharged from said pump; and

(b) a conduit arrangement for feeding the surplus hydraulic fluid discharged from said pressure regulator valve to both a torque converter and a final gear;

wherein said pressure regulator valve includes first and second drain ports and wherein said pressure regulator includes:

a first conduit leading from said first drain port to said torque converter;

a second conduit leading from said second drain port to said final drive unit;

a first relief valve in said first conduit for relieving excess hydraulic fluid into said second conduit; and

a second relief valve for relieving excess fluid in said second conduit to a sump of said transmission,

said pressure regulator valve being arranged so that when the amount of hydraulic fluid drained off via said port increases the amount drained via said second port decreases and vice versa.

4,601,220

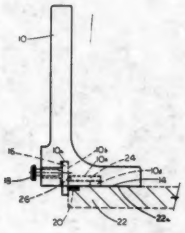
SKI EDGE TUNING TOOL

Stephen J. Yurick, Jr., P.O. Box 276, R.D. #3, Phoenixville, Pa. 19460

Filed Sep. 13, 1984, Ser. No. 650,074

Int. Cl.[4] B21K *17/00*; B23D *67/12*

U.S. Cl. 76—83 **8 Claims**



1. A tool for sharpening the edges of skis comprising:

a body portion having a handle portion and a flat bottom surface portion designed to slide over the bottom surface of a ski;

means for retaining a file in fixed relation and at substantially right angles to said bottom surface portion of said body portion; and

a magnet retained in a recess in said bottom surface and juxtaposed to said file such that ferrous filings from filing edges of skis are attracted to and retained by said magnet,

wherein said recess is sufficiently deeper than the thickness of the magnet that clearance is provided between the surface of the magnet and a ski juxtaposed to the bottom surface of said tool when in use, and said recess further includes a cleaning recess formed in the bottom surface of the tool away from the file.

4,601,221

CLAMPING DEVICE FOR RECTANGULAR WORKPIECE

Ralph W. Kalkbrenner, Irwin, and Hans E. Leumann, Washington, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

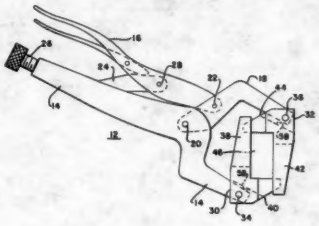
Filed Nov. 9, 1984, Ser. No. 670,419

Int. Cl.[4] B25B *7/02*

U.S. Cl. 81—418 **7 Claims**

1. A clamping device for holding a workpiece of rectangular configuration along its entire perimeter, comprising:

(a) two opposed L-shaped jaws with each jaw pivotally mounted and including a pair of jaw portions extending perpendicular to each other forming rectangular openings between oppositely-facing jaws so as to automatically orient to the rectangular shape of a workpiece; and



(b) support means separately supporting the jaws pivotally for movement to and from each other.

4,601,222

TOOL HEAD ASSEMBLY

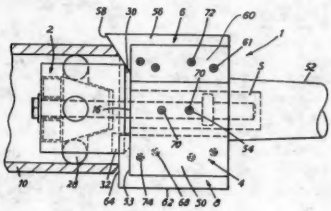
William A. Gill, Erskine, Scotland, assignor to Babcock Power Limited, London, England

Filed Feb. 25, 1985, Ser. No. 705,352

Claims priority, application United Kingdom, Feb. 24, 1984, 8404922

Int. Cl.[4] B23B *5/16*

U.S. Cl. 82—4 C **4 Claims**

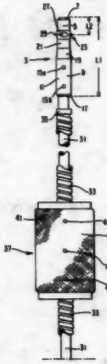


1. A tool head assembly for preparing a tube for welding which tool head assmebly includes a rotatable center pilot adapted to enter a bore of a tube and to center the tool head assembly, the center pilot including a housing accommodating a multiplicity of ball bearings which are rotatable relative to the housing and which are adjusted to vary an operative diameter of the center pilot to coincide with a bore of the selected tube, the housing having a bevelled portion provided with a surface which diverges away from a central axis of the housing the surface acting as a reference for setting the cutting angle of a bevelling tool by a portion of a cutting edge of the bevelling tool abutting against said surface, said bevelled portion including an axial keyway, a facing tool said keyway keying said facing tool to the center pilot, and a rotatable support on which the bevelling tool and the facing tool are located which support is engaged with the center pilot and connected to a machine tool, whereby the rotating center pilot is entered into the bore of the tube to center the tool head assembly by effecting rotation of the ball bearings by rolling contact with the bore of the tube thereby enabling cutting of a surface of the tube into a predetermined profile of revolution co-axial with the tube to be effected by the bevelling tool and the facing tool to prepare the tube for welding.

4,601,223
FLAIL TUBE CUTTER

Edward J. Choby, Irwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 16, 1984, Ser. No. 631,371
Int. Cl.[4] B23D 21/14
U.S. Cl. 82—82 28 Claims



1. An apparatus for cutting the inside surface of a conduit by a flailing motion, comprising:

(a) an elongated, substantially cylindrical cutting head having a distal end and a proximal end which is circumscribed by a generally circular cutting blade having a serration for defining two cutting teeth for both cutting the inside wall of the conduit, and for generating a striking motion between the cutting blade and the conduit when the head is rotated therein wherein said blade circumscribes said cutting head at a point between 12% and 32% of the length of the cutting head as measured from the distal end;

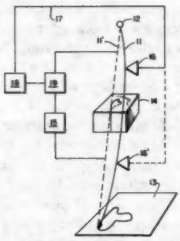
(b) a means for rotating said cutting head, and

(c) a flexible shaft coupled to the proximal end of said cutting head and at the other end to said rotating means for both rotating said cutting head about its longitudinal axis and for flailing said cutting blade of said cutting head against the inside surface of said conduit when said cutting head is inserted therein and said rotating means rotates said shaft.

4,601,224
HOT WIRE CUTTING SYSTEM

William T. Clark, III, No. 6 Davis Blvd., New Orleans, La. 70121

Filed Oct. 5, 1984, Ser. No. 658,435
Int. Cl.[4] B26D 7/10
U.S. Cl. 83—74 9 Claims



1. A hot wire cutting stystem comprising,

a heating wire adapted to be supported under tension at opposite end portions in a position for said wire to be engaged by material being cut, wherein a force applied by uncut material against the wire displaces said wire from a normal position,

power circuit means for supplying heating current to said wire,

said power circuit means being adapted to be connected to a source of electrical power and including control means for respectively increasing and decreasing the heating current supplied to the wire,

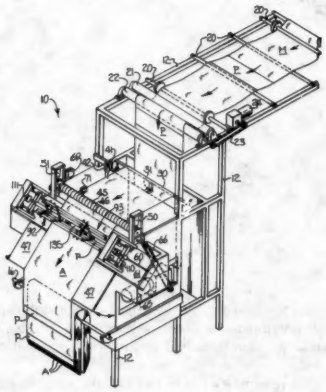
sensing means responsive to the deflection of said wire from said normal position for producing an error signal representative of the estent of said deflection,

said control circuit means being responsive to said error signal for respectively increasing and decreasing the heating current supplied to said wire representative of extent of said deflection.

4,601,225
APPARATUS FOR AUTOMATICALLY CUTTING APART SUCCESSIVE ARTICLES

Dennis L. Starnes; William G. Kimball, both of Kannapolis, and Robert E. Watson, Concord, all of N.C., assignors to Cannon Mills Company, Kannapolis, N.C.

Filed Mar. 4, 1985, Ser. No. 707,745
Int. Cl.[4] B26D 7/02, 7/14
U.S. Cl. 83—175 13 Claims



1. Apparatus for automatically cutting apart successive articles, such as terry towels, from a continuous length of material, in which such articles are separated therein by portions extending transversely across the material and of less thickness than the articles, so that each cut article has an equal amount of the thinner portion remaining on each cut edge for subsequent hemming or the like; said apparatus comprising:

frame means;

cutting means carried by said frame means for transversely cutting the material to separate the successive articles;

means carried by said frame means for sequentially feeding the continuous material through said apparatus in generally a longitudinally-extending path of travel and for stopping the material in a cutting position in which the next successive thinner separating portion of the material is generally adjacent said cutting means; and

means carried by said frame means for aligning and positioning the thinner separating portion of the material relative to said cutting means so that said cutting means will cut the articles apart generally through the center of the thinner separating portion of the material, said aligning and positioning means comprising a pair of movable blade

means positioned transversely across and perpendicularly to one surface of the material in said apparatus and in equally spaced relation on each side of said cutting means, means for moving said pair of blade means between a first position out of engagement with the material when the material is being fed by said feeding means and a second position in engagement with the thinner separating portion of the material which has been positioned adjacent said cutting means, and means for moving each of said blade means after engagement with the material between an inward position in which said blade means are spaced apart a distance less than the longitudinal dimension of the thinner separating portion in the material and an outward position in which said blade means are spaced apart a distance substantially equal to the longitudinal dimension of the thinner separating portion, so that said blade means will be moved apart into engagement with the respective edges of the thicker articles joining the thinner separating portion transversely across the material for aligning and positioning the thinner separating portion equally on each side of said cutting means.

4,601,226

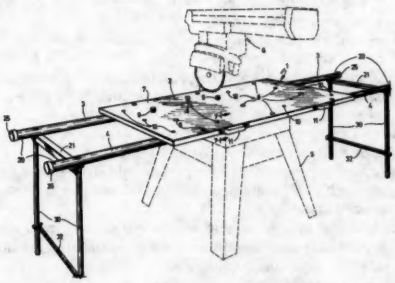
SLIDE TABLE FOR POWER SAWS

Maurice L. McClintock, 628 Hendricks, Anderson, Ind. 46016

Filed Aug. 17, 1984, Ser. No. 641,805

Int. Cl.⁴ B27B 5/16

U.S. Cl. 83—415 **2 Claims**



1. A slide table comprising a table top having provided in the top surface thereof a plurality of recesses adapted to receive a plurality of fence pins removably inserted therein and a plurality of fence pins each of which is adapted to be removably inserted into any of the said recesses, the said table top having provided therethrough a plurality of internally threaded coupling means adapted to receive a plurality of clamp means detachably coupled thereto, the said table top having provided on the bottom thereof a plurality of slide means fixed in spaced apart relationship relative to each other, each of which slide means comprises a collar adapted to slidably engage a guide rail for reciprocating lengthwise movement relative thereto and each of which slide means is adapted to limit vertical and lateral movement of the said table top relative to a pair of guide rails, and wherein the said table top is provided with handle means adapted to be grasped by a person, and guide means comprising a pair of horizontal and parallel guide rails fixed by a plurality of suitable spacer means in spaced apart relationship relative to each other, wherein each of the said guide rails comprises a plurality of rail members detachably coupled together end-to-end by suitable coupling means and wherein each of the said guide rails is adapted to be detachably coupled to a base of a power saw, and means for supporting each end of each of the said guide rails, each means comprising an adjustable length leg depending vertically from a said guide rail and adapted to rest on the floor of a work area, said rails having provided on the ends thereof caps adapted to cover and protect the said ends of the said rails.

4,601,227

FOOD PRODUCT WITH OPPOSITE PHASE-SHIFTED CORRUGATIONS OF THE SAME FREQUENCY AND AMPLITUDE AND METHOD AND APPARATUS OF MANUFACTURE

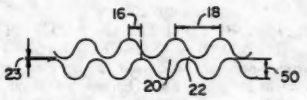
Margaret Fitzwater, Lewisville, and Lewis C. Keller, Watauga, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Division of Ser. No. 519,986, Aug. 3, 1983, Pat. No. 4,511,586.

This application Jan. 15, 1985, Ser. No. 691,576

Int. Cl.⁴ B26D 1/03

U.S. Cl. 83—403 **4 Claims**



1. An apparatus for producing slices of a food material comprising:

(a) first and second fluted cutting blades having substantially parallel flutes of substantially identical frequency and amplitude, wherein the flutes of said first cutting blade are offset relative to the flutes of said second cutting blade by a distance substantially equal to ¼ the pitch distance of said flutes;

(b) means supporting said first and second cutting blades in spaced relationship and defining a cutting path for the food material; and

(c) means for moving the food material in the cutting path to form cuts in the food material by the first and second cutting blades to form a slice of food material having corrugations on opposite surfaces which are phase shifted by about ¼th the pitch distance of said corrugations.

4,601,228

PRESS KNIVES

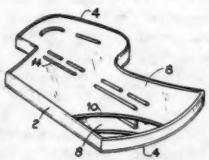
Michael Steadman, 9 Francis Dickins Close, Wollaston, Northamptonshire, and Ronald H. Luck, 79 The Headlands, Weston Favell, Northampton, both of England

Filed Dec. 16, 1983, Ser. No. 562,468

Claims priority, application United Kingdom, Dec. 21, 1982, 8236319

Int. Cl.⁴ A43D 7/12

U.S. Cl. 83—862 **6 Claims**



1. A press knife comprising a continuous length of blade extending in a closed loop defining a desired shape to be cut from sheet material and having at least one endless cutting edge extending in a plane, at least one elongate reinforcing member extending chordwise of the blade and connected at its opposite ends to the blade, two support plates disposed parallel to each other on opposite sides of the reinforcing member which support plates are connected together and are shaped to fit within the perimeter of the continuous blade and closely to the blade so as to be located for sliding movement relative to

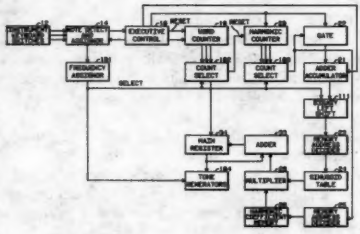
the blade in a direction normal to said plane, the two plates having slots therein, the slot or slots in each plate being aligned with the slot or slots therein, the slot or slots in each plate being aligned with the slot or slots in the other plate, and at least one marking strip located in a slot of one of the plates and in the aligned slot in the other plate so as to bridge the two plates, opposite edges of each marking strip projecting beyond the two plates respectively whereby the marking strip can move relative to the blade in said direction normal to said plane.

4,601,229

POLYPHONIC TONE SYNTHESIZER WITH HARMONIC RANGE SELECTION

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Apr. 5, 1985, Ser. No. 720,471
Int. Cl.[4] G10H *1/02*
U.S. Cl. 84—1.01 **9 Claims**



1. In combination with a keyboard operated musical instrument having a plurality of keyswitches in which a plurality of data words corresponding to the amplitudes of evenly spaced points defining the waveform of a musical tone are computed during each one of a sequence of computation cycles from a preselected set of harmonic coefficients and are transferred sequentially and converted into musical waveshapes at a rate proportional to the fundamental frequency of the musical tone being generated, apparatus for adaptively varying the number of said plurality of data words to the fundamental frequency of said generated musical tone comprising;

a detection means responsive to the closure of a keyswitch in said plurality of keyswitches whereby a select signal is encoded to denote one of a plurality of non-overlapping fundamental frequency ranges associated with said plurality of keyswitches,

a harmonic coefficient memory means for storing a preselected set of harmonic coefficients,

a waveshape memory means,

a harmonic addressing means responsive to said select signal for reading out a subset of said preselected set of harmonic coefficients from said harmonic coefficient memory means,

a computing means responsive to said select signal and responsive to said subset of said preselected set of harmonic coefficients whereby said number of said plurality of data words are computed and stored in said waveshape memory means and whereby said number is adaptively varied to correspond to the fundamental frequency of said generated musical tone, and

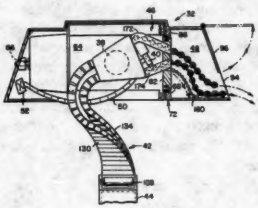
a means for producing musical tones responsive to the number of said plurality of data words in said waveshape memory means.

4,601,230

WEAPON SYSTEM

Richard S. LeBlanc, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 680,799, Dec. 13, 1984, Pat. No. 4,574,683, which is a continuation of Ser. No. 437,853, Oct. 29, 1982, abandoned. This application Aug. 2, 1985, Ser. No. 761,917
Int. Cl.[4] F41H *7/06*
U.S. Cl. 89—1.2 **2 Claims**



1. A weapon system for a turret comprising:

a rotor having first and second ends rotatable about a horizontal axis,

a main gun and a coaxial machine gun attached to said rotor, said main gun and said machine gun each using link-fed ammunition,

a first mounting means for mounting said first end of said rotor to the turret, said first mounting means comprising a trunnion bearing means,

a second mounting means for mounting said second end of said rotor to the turret,

a compartment adjacent the outboard portion of said trunnion bearing means and communicating with the exterior of the turret,

an end cap attached to said first end of said rotor and having a plurality of openings formed therein,

an ejecting means for ejecting spent links from said main gun through one of said openings in said end cap and into said compartment,

an ejecting means for said machine gun for ejecting spent links and spent brass through a second opening in said end cap and into said compartment,

a door hingedly attached to said turret for partially closing said compartment and providing a slot through which said spent links and spent brass which accumulate in said compartment are allowed to pass to the exterior of the turret, and

a third opening in said end cap for allowing propellant gases from said main gun and said machine gun to be ejected into said compartment.

4,601,231

ROTARY ACTUATOR AND MAKING METHOD THEREOF

Shinobu Shimoda, Tachikawashi, Japan, assignor to Torquer Co., Ltd., Tachikawa, Japan

Continuation-in-part of Ser. No. 267,392, May 26, 1981, abandoned. This application Aug. 7, 1984, Ser. No. 639,072
Int. Cl.[4] F15B *15/22*; F01C *9/00*
U.S. Cl. 91—26 **6 Claims**

1. A rotary cylinder comprising:

a cylinder having an inner wall, end walls, and means interconnecting the interior of said cylinder with a source of viscous oil;

a shaft mounted in said cylinder and supported for rotation about its longitudinal axis, said shaft including opposed axially spaced flange means having an outer diameter, the outer diameter of said flange means being less than the diameter of said cylinder inner wall;

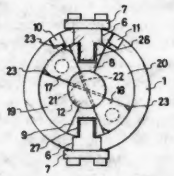
vane means, disposed on opposing sides of said shaft, includ-

ing means for securing said vane means to and between facing surfaces of said opposing flange means, said vane means including opposed radial faces extending between said cylinder inner wall and said shaft;

stopper elements positioned between said flange means facing surfaces on diametrically opposing sides of said shaft, said stopper elements including opposed radial faces extending between said cylinder inner wall and said shaft;

means for restraining rotation of said stopper elements carried by said cylinder;

said vane means and said stopper elements defining therebetween at least one pair of variable volume chambers disposed on opposite sides of said shaft with one of said chambers being in communication with said interconnecting means;



means, extending through said shaft, for communicating one of said chambers of said pair with the other of said chambers;

radial bearing means supporting said flange means closely adjacent to said cylinder inner wall; and

means for preventing leakage of oil from said chambers, said leakage preventing means consisting only of said flange means, said cylinder inner wall and said viscous oil,

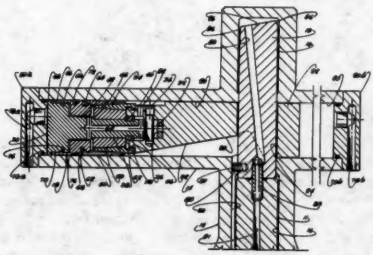
wherein each said flange means comprises a first portion and a second portion, said second portion having said outer diameter, said first portion being supported by a bearing supported by said bearing means, said preventing means including said second portion, and said first portion being of a lesser diameter than said second portion.

4,601,232

ROD LOCKING DEVICE

John N. Troxell, Jr., Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Mar. 1, 1985, Ser. No. 707,200
Int. Cl.[4] F15B *15/26*
U.S. Cl. 92—24 **7 Claims**



1. A ram locking apparatus used on a blowout preventer having a housing, a ram, ram actuating means having a closing side and a retracted side and a tail rod having its inner end connected to the ram actuating means and its outer end engaged by said apparatus to lock said ram, said apparatus comprising

a lock housing having a closed end and a hollow interior connected to the exterior of the preventer housing in which the tail rod is positioned,

a body positioned within said lock housing,

a primary piston,

a lost motion connection between said primary piston and said body,

a lock piston associated with said primary piston and movable axially with respect to said primary piston,

a tapered split locking ring interconnected to said lock piston,

wedging means within said split locking ring, and

means for supplying fluid under pressure into said lock housing for movement of said pistons,

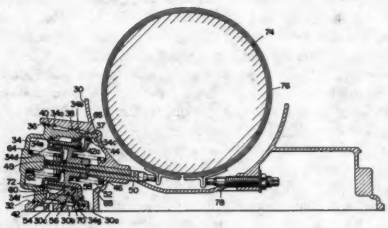
the initial pressure on said primary piston causing movement of said body to engage the ram tail rod and subsequently moving said lock piston relative to said wedging means and to thereby wedge said split locking ring against the interior of said lock housing to lock said body therein against movement in said lock housing.

4,601,233

HYDRAULIC SERVO DEVICE WITH BUILT-IN ACCUMULATOR

Kazuhiko Sugano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 5, 1984, Ser. No. 658,218
Claims priority, application Japan, Oct. 14, 1983, 58-190871
Int. Cl.[4] F01B *7/00, 7/20*
U.S. Cl. 92—52 **1 Claim**



1. A hydraulic servo device with a built-in accumulator, comprising:

a servo cylinder formed with a first inner diameter portion, a second inner diameter portion and a third inner diameter portion, said first inner diameter portion having the largest diameter, said second inner diameter portion having a diameter larger than said third inner diameter portion and said third inner diameter portion having the smallest diameter;

a servo piston having a large diameter outer diameter portion fit in said first inner diameter portion of said servo cylinder and a small diameter outer diameter portion;

an accumulator piston having a large diameter outer diameter portion fit in said second inner diameter portion of said servo cylinder and a small diameter outer diameter portion fit in said third inner diameter portion of said servo cylinder, said accumulator piston having an inner diameter portion fit around said small diameter outer diameter portion of said servo piston; and

an accumulator piston spring biasing the accumulator piston toward said servo piston;

said large diameter outer diameter portion of said servo piston cooperating with said first inner diameter portion of said servo cylinder to define a first pressure acting area which is adapted to receive a servo release pressure;

said large diameter outer diameter portion of said servo piston and said small diameter outer diameter portion thereof defining therebetween a second pressure acting area which is adapted to receive a servo apply pressure;

said large diameter outer diameter portion of said accumulator piston and said small diameter outer diameter portion thereof defining therebetween a third pressure acting area which is adapted to receive an accumulator pressure.

4,601,234

PRESSURE CYLINDER

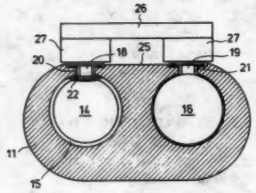
Rainer E. Hoinkis, Filderstadt, Fed. Rep. of Germany, assignor to ORIGA GmbH Pneumatik, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,073

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340291

Int. Cl.[4] F01B *29/00*

U.S. Cl. 92—88 **7 Claims**



1. A pressure cylinder comprising:

a casing having walls defining two side-by-side parallel tubes having longitudinal slots extending radially of the tubes through the casing, the slots both being disposed on a same side of the casing, the slots separating the casing into an inner partition and two outer walls;

two pistons disposed in the casing, the pistons being slidable in the tubes, the pistons having packings sealingly slidable to seal the pistons with respect to the tubes and the slots;

two force removal extensions attached to the pistons and extending radially of the pistons through the slots, the force removal extensions being parallel to one another;

a joint plate rigidly attached to the force removal extensions, the joint plate and the force removal extensions rigidly holding the pistons on opposite sides of the inner partition such that the pistons are aligned to slide along the inner partition; and,

means for supplying a pressure medium to the tubes to drive the pistons in the tubes;

whereby deformation of the casing upon supplying the pressure medium to the tubes cannot disturb alignment of the pistons around the inner partition.

4,601,235

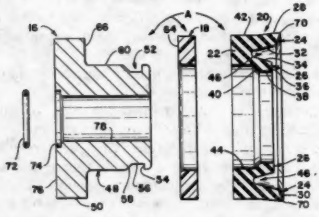
RECIPROCATING PUMP PISTON

Emmett T. Roberts, Houston, Tex., assignor to TRW Inc., Cleveland, Ohio

Filed Jun. 18, 1984, Ser. No. 621,832

Int. Cl.[4] F16J *9/00*

U.S. Cl. 92—245 **12 Claims**



1. A pump piston construction comprising:

a piston rod adapted to be disposed within a cylinder;

a piston hub secured to said piston rod and adapted to be reciprocated thereby, said hub including a flange portion having a cylindrical outer periphery of a slightly smaller diameter than a cylinder with which it is adapted to be associated and a generally cylindrical body portion having a smaller diameter than said flange portion, said body portion terminating in a forward end spaced remote from said flange portion and including a circumferential groove having a forward side wall adjacent said forward end;

an annular piston seal ring having a body member slideably received and closely disposed about said hub body portion, an axially extending inner leg having a radially inwardly extending end portion in mating relation with said body portion groove and an outer leg defining an annular sealing lip having a maximum outer diameter slightly greater than the inner diameter of a cylinder with which said piston is adapted to be associated; and,

said inner and outer legs being laterally spaced apart from each other to facilitate radial outward flexure of said inwardly extending end portion of said inner leg during installation of said seal ring on said hub body portion with an inner leg end wall area closely bounded by said groove forward side wall, said outer leg adapted to yieldably flex radially inward in response to axial insertion thereof into an associated cylinder, said inward flexure being to a predetermined extent such that said inner leg will contact said outer leg before said inner leg end wall area can be moved to a fully unbounded relationship with said groove forward side wall to thereby prevent said seal ring from sliding off said hub body portion.

4,601,236

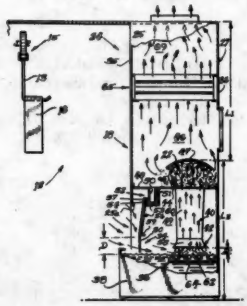
PUMP-LESS PAINT SPRAY BOOTH

Stanley C. Napadow, Elgin, Ill., assignor to Protectaire Systems Co., Elgin, Ill.

Filed May 14, 1984, Ser. No. 609,744

Int. Cl.[4] B05B *15/12*

U.S. Cl. 98—115.2 **11 Claims**



1. In a no-pump spray booth for removing air borne water and contaminant particulates, the combination comprising: a housing having a predetermined height for enclosing water washes and air travel, a lower water reservoir at the lower end of the housing for containing a body of water to have a predetermined water level range, a blower for pulling air through the housing at velocities to lift water vertically from the lower reservoir, a plurality of ducts having lower ends spaced above the water level at a predetermined distance to cause an entrainment of water particles for lifting from the body of water for upward flow through the ducts to discharge at upper ends of ducts, turbulence means located above the discharge ends of the ducts to deflect the air and entrained moisture and to cause a turbulence zone to wet air borne particulates to remove the same from the air stream, a plenum in said housing into which

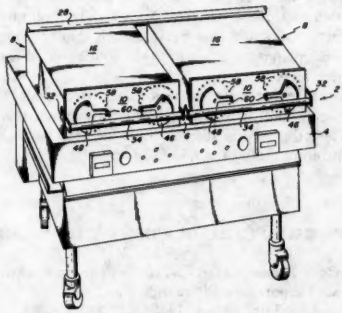
flows the air and air borne water particles from the turbulence zone for substantially reducing the air flow velocity to sub-entrainment velocity, an upper water reservoir located in the lower half of the housing for collecting and holding the water lifted through the ducts and deposited when the air velocity is reduced to sub-entrainment velocities in the plenum, a water curtain means located with its upper end in the lower half of the booth and conveying the water from the upper water reservoir in a curtain across the booth and downwardly to drop from a lower edge thereof as a waterfall across an air gap into the lower reservoir, the upper discharge ends of said ducts being located at or below the mid-height of the housing to provide the plenum with a vertical height and extent substantially equal to or greater than the one-half of the booth height, moisture eliminator means above the plenum to trap any moisture particulates flowing through the plenum, said eliminator means being located at least two and one-half feet above said turbulence means to provide a plenum of at least two and one-half feet in which the air velocity slows down to less than said sub-entrainment velocity for the water and contaminant particulates.

4,601,237

ADJUSTABLE MEAT PRESS FOR TWO-SIDED COOKING

David W. Harter, Corydon, Ind., and Joseph R. van Bogaert, Louisville, Ky., assignors to Vulcan-Hart Corporation, Louisville, Ky.

Filed Jul. 16, 1985, Ser. No. 755,336
Int. Cl.[4] A47J *37/06*
U.S. Cl. 99—349 **11 Claims**



1. Apparatus for modifying a grill having a fixed, planar, generally horizontal heated cooking surface to provide two-sided cooking of a food product such as meat and the like, comprising

(a) a movable cooking device having a planar heated cooking surface;

(b) means for pivotally connecting one edge wall of said movable cooking device with an edge wall of the grill, whereby said movable device is pivotable between a closed position wherein said movable cooking surface is arranged spaced from and parallel to the fixed cooking surface and an open position wherein said movable cooking surface is arranged at an angle relative to the fixed cooking surface; and

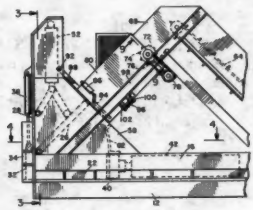
(c) incrementally adjustable spacing means connected with said movable cooking device for controlling the spacing between said movable and fixed cooking surfaces when said movable device is in the closed cooking position, said spacing means comprising a plurality of spacing members arranged about the peripheral edge of said movable device in interconnected pairs, said members of each pair being arranged at opposite edges of said movable device, whereby when a food product of a given thickness is placed on the fixed cooking surface of the grill and said movable device is pivoted to the closed position with said spacing members resting on the fixed cooking surface, said spacing means are adjusted to maintain said movable surface parallel to and spaced from said fixed surface by a distance corresponding with the thickness of the food product, thereby to compress the food while cooking the product from opposite sides.

4,601,238

CAN-BALING MACHINE

Chales M. Davis, Jr., 23 The Point, Coronado, Calif. 92118, and Robert M. Davis, 1018 Gem La., Ramona, Calif. 92065

Continuation-in-part of Ser. No. 549,083, Nov. 7, 1983, abandoned. This application Oct. 15, 1984, Ser. No. 661,109
Int. Cl.[4] B30B *9/32*
U.S. Cl. 100—45 **8 Claims**



1. A can baling machine for crushing a quantity of metal cans into a substantially rectangular self-sustaining bale comprising:

a housing containing an elongated rectangular baling chamber having an upper inlet opening and a discharge opening at one end, with a door normally closing the discharge opening;

a plunger reciprocally mounted in said chamber with activating means for driving the plunger in a compression stroke toward said door;

a hopper above said chamber;

a compression door mounted in said hopper with actuating means for closing the compression door into said inlet opening to form an upper wall of said chamber;

and feed means for feeding cans with means for crushing and tearing cans to produce ragged protruding portions on the cans; said precrusher comprising a driven rotatable drum having projecting teeth axially spaced therein, and a backing plate biased toward said drum with ribs thereon fitting between said teeth to catch cans therebetween.

4,601,239

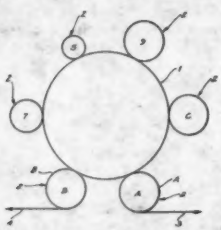
APPARATUS FOR PRINTING QUASI RANDOM NUMBER TABLES

Ian M. Sillars, 65A Pine St. (Lower), Cammeray, New South Wales 2062, Australia

Filed Oct. 2, 1985, Ser. No. 783,141
Claims priority, application Australia, Dec. 24, 1984, PG8714
Int. Cl.[4] B41J *45/00*
U.S. Cl. 101—76 **5 Claims**

1. Apparatus for printing quasi-random number tables (as herein defined) comprising a flexographic printing press having at least two table printing cylinders arrayed about a central drum, said table printing cylinders having different circumferences, the circumference of each cylinder being a multiple of a basic pitch value, each one of the table printing cylinders being arranged to print at least one column of numbers incorporating

a predetermined number of numbers therein different from the number of numbers printed in a column by another of the said



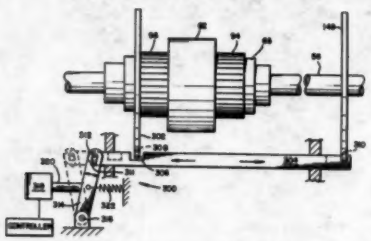
cylinders, the columns of numbers being arranged alongside one another in a predetermined matrix.

4,601,240

PRINT DRUM SECURITY SYSTEM

Paul R. Sette, Hamden, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 4, 1984, Ser. No. 657,650
Int. Cl.[4] B41L *47/46*
U.S. Cl. 101—91 **8 Claims**



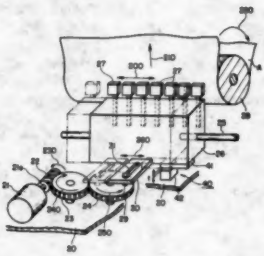
1. A postage meter for printing selected value amounts on a print receiving surface, comprising:
- a rotatable print drum,
- a plurality of value print wheels mounted within the print drum and each having a plurality of value print elements, said print wheels being selectively adjustable to align selected print elements in an operative position in which they are exposed at the surface of the drum,
- means for rotating said print drum to move the selected value print elements through a printing position to form an imprint on a said print receiving surface,
- a plurality of toothed value selection racks, equal in number to the number of said print wheels and each associated with a different print wheel,
- said racks being mounted in a shaft aligned axially with, and mounted for rotation with, said print drum, said racks being displaceable axially of said shaft for adjusting said print wheels to position selected print elements in operative position,
- a pinion mounted on an annular memeber rotatable about said shaft for selective engagement of said pinion with said racks one at a time for displacing said racks,
- means for rotating said annular member about said shaft for shifting said pinion from rack to rack and for rotating said pinion to displace a rack engaged thereby, and
- a shutter bar selectively engageable with said annular member for locking said annular member against rotation during rotation of the print drum and with said print drum for locking the print drum against rotation during value selection.

4,601,241

DOT LINE PRINTER

Shinsuke Fujiwara, Osaka, Japan, assignor to NEC Home Electronics, Ltd., Osaka, Japan

Filed Jan. 28, 1985, Ser. No. 695,348
Claims priority, application Japan, Jan. 31, 1984, 59-15783
Int. Cl.[4] B41J *3/00*
U.S. Cl. 101—93.04 **4 Claims**



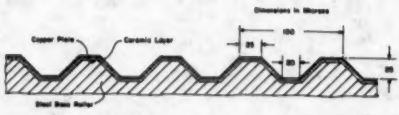
1. A dot line printer comprising:
- a head carriage;
- a plurality of printing heads mounted on said carriage at equal separations;
- a platen mounted in confronting relationship with said heads and adapted for receiving and advancing a sheet to be printed in a given direction;
- a linear scale mounted on said head carriage for movement therewith, said linear scale including a plurality of magnets positioned side by side such that the north pole of each magnet is adjacent to the south pole of another magnet; and
- a linear sensor mounted stationary with respect to said linear sacale and at a predetermined clearance therefrom for detecting linear displacement of said scale to provide printing timing for said heads.

4,601,242

COPPER AND CERAMIC COMPOSITE INK METERING ROLLER

Thomas A. Fadner, LaGrange, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1985, Ser. No. 698,201
Int. Cl.[4] B41F *31/26*
U.S. Cl. 101—348 **9 Claims**

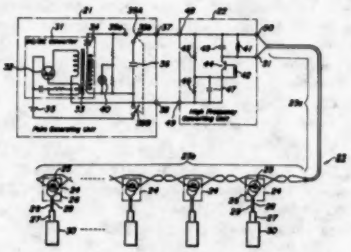


1. An ink metering roller for use in lithographic printing comprising:
- (a) a base roller of suitable diameter and length having an engraved outer surface;
- (b) a substantially continuous layer of an oleophilic/hydrophobic material having a water contact angle of 80° or higher and an ink contact angle of 10° or lower and spreading integrally bonded to the engraved outer surface of said base roller to form a substantially uninterrupted film thereover; and
- (c) an outer microporous ceramic layer bonded to said oleophilic/hydrophobic layer to form the outermost layer of material on said base roller.

4,601,243
METHOD AND APPARATUS FOR ELECTRICALLY DETONATING BLASTING PRIMERS

Takeo Ueda, and Yoshiro Ohsumi, both of Aichi, Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 656,891
Claims priority, application Japan, Oct. 19, 1983, 58-194118
Int. Cl.[4] F42D *1/04;* F42C *11/00*
U.S. Cl. 102—200 15 Claims



1. A method of blasting electrically a plurality of detonating primers by supplying an electric current through a bus wire with which leg wires of detonating primers are electromagnetically coupled by means of a plurality of magnetic cores, comprising

inserting loops connected to said leg wires of detonating primers into said magnetic cores through openings thereof;

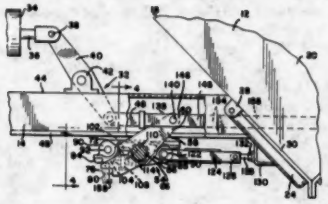
inserting a plurality of portions of one conductor of said bus wire into the respective magnetic cores through openings thereof, the other conductor of the bus wire being spaced from said one conductor by a substantially constant distance so that the bus wire has a substantially constant impedance; and

flowing a high frequency current through said bus wire to induce in the respective loops a high frequency secondary current due to a transforming action of said magnetic cores, whereby said induced high frequency currents are supplied to the respective detonating primers through the leg wires to blast the detonating primers.

4,601,244
OPERATING SYSTEM FOR RAILROAD HOPPER CAR GATE ASSEMBLY DOORS

Robert T. Fischer, Homewood, Ill., assignor to Miner Enterprises, Inc., Geneva, Ill.

Filed Jul. 5, 1985, Ser. No. 751,902
Int. Cl.[4] B61D *7/18, 7/26, 7/28*
U.S. Cl. 105—240 9 Claims



1. An operating system for gate assembly doors of a hopper-type railroad car, said system comprising a lever activating device including:

a lever arm rotatively carried on a shaft attached to a sill of said car with one end of said arm centrally located in said sill to connect with means to effect operation of said system,

a crank arm rotatively carried by said shaft between plates in part defining said lever arm with ends of said crank arm to connect with pairs of doors of adjacent gate assemblies at a point midway between doors of said door pairs,

an intermediate bar having ends attached to said lever arm plates and extending through an opening in said crank arm to engage an intermediate bolt threadedly secured to said crank arm, and

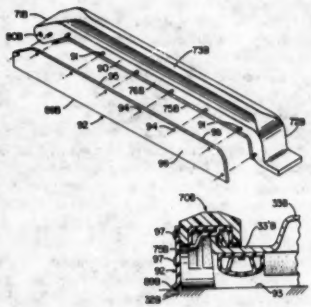
an outer bar attached to opposite ends of said lever arm plates with an outer bolt threadedly secured to said outer bar to engage said crank arm,

wherein a relative position of said gate door pair with respect to said operation means may be regulated by adjusting a position of said bolts to relocate said crank arm with respect to said lever arm on said shaft.

4,601,245
HOLDDOWN BAR FOR A HATCH COVER OF A RAILROAD CAR

Donald L. Kleykamp, Washington Township, Montgomery County, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 19, 1983, Ser. No. 459,273
Int. Cl.[4] B61D *39/00*
U.S. Cl. 105—377 3 Claims



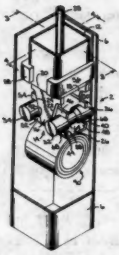
1. In a railroad car having a surface means provided with a pair of hatch covers respectively covering a pair of hatch openings in said surface means and a pair of like holddown bars respectively for said hatch covers, each said holddown bar having opposed sides and opposed ends one of which is pivotally mounted to said surface means of said car and the other of which is releasably latched to said surface means of said car while a medial portion thereof intermediate said opposed ends extends across its respective hatch cover and carries a sealing gasket means in a channel means thereof that engages against its respective hatch cover, each said holddown bar having a rain shield secured to one of said opposed sides thereof at said medial portion and opposed ends thereof and being disposed adjacent and outboard of an end of its respective hatch cover for protecting the same from the elements, the improvement wherein each said rain shield comprises a one-piece member formed of a relatively flexible polymeric material and having an edge means that is flexed against said surface means and thereby substantially conforms to the contour of said surface means to substantially seal said rain shield against said surface means, each said holddown bar and its respective rain shield respectively have securing means that secure the same together, said securing means of each said holddown bar comprising a plurality of spaced apart like projections extending outwardly from both of said sides thereof at said medial portion and said opposed ends thereof whereby said rain shields are secured to different sides of said holddown bars.

4,601,246

SUPPORT ASSEMBLY FOR OVERBED TABLE

Frank M. Damico, Neenah, Wis., assignor to Thill, Inc., Oshkosh, Wis.

Filed May 7, 1984, Ser. No. 607,922
Int. Cl.[4] E04G 25/08
U.S. Cl. 108—144 5 Claims



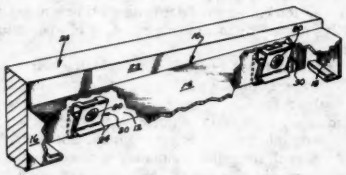
1. A support assembly for an overbed table comprising:
a lower pedestal column mounted on a base;
an upper pedestal column telescopically slideable within said lower column, and supporting said table;
a wedge and roller clutch at the bottom of said upper column, comprising:
wedge means fixed to said upper column and extending downwardly from the lower end thereof and having opposing camming surfaces;
retainer means mounted to release means and movable up and down toward and away from the bottom of said upper column; and
roller means loosely received in said retainer means and forced laterally horizontally outwardly against the inner wall of said lower column by said camming surfaces of said wedge means to stop downward movement of said upper column and support said table, downward movement of said release means and said retainer means permitting lateral inward movement of said roller means out of forced cammed engagement with said inner wall of said lower column, to permit downward movement of said upper column and table; wherein:
said retainer means includes positive break disengagement means positively forcing said roller means downwardly during downward movement of said release means and retainer means to release said roller means from said forced cammed engagement with said inner wall of said lower column;
said roller means comprises one or more rollers;
said positive break disengagement means of said retainer means comprises a pair of laterally spaced slots for each said roller proximate the distal ends of the respective said roller, each slot extending laterally horizontally and formed by a pair of vertically spaced laterally extending retainer ears such that each roller is retained between a pair of upper ears proximate its distal ends and a pair of lower ears proximate its distal ends to prevent slewing or canting of the roller within said retainer means, upward movement of said retainer means and release means causing said lower ears to force said roller upwardly against said camming surfaces of said wedge means which forces said roller laterally outwardly to be in position ready for forced cammed engagement with said inner wall of said lower column to support said upper column and table when loaded, downward movement of said retainer means and release means causing said upper ears to positively drive said roller downwardly permitting lateral inward movement of said roller out of forced cammed engagement with said inner wall of said lower column;
each said roller has a reduced diameter central portion between larger diametered distal end sections, and wherein said ears of said retainer means engage said roller at said larger diametered distal end sections;
and further comprising a resilient tubing member surrounding said reduced diameter central section of said roller and engaging said inner wall of said lower column during upward movement of said upper column and table to prevent contact of said roller with said inner wall of said lower column during said upward movement to further reduce noise, and such that when said roller is in said forced cammed engagement with said inner wall of said lower column to support said table, said resilient tubing member is deformed and compressed toward said reduced diameter central section of said roller such that said distal end sections of said roller engage said inner wall of said lower column to stop downward movement of said upper column and table.

4,601,247

RESILIENT FASTENER CLIP AND JOINT THEREFOR

Montgomery J. Welch, Spring Lake; Terry Mitchell, Jenison, and David H. Hodge, Hopkins, all of Mich., assignors to Modular Systems, Inc., Fruitport, Mich.

Filed Aug. 15, 1984, Ser. No. 641,067
Int. Cl.[4] A47B 5/00
U.S. Cl. 108—152 40 Claims



1. A fastener clip for securing one member to a single surface of a support, the support having a headed securing stud extending from that one surface, said clip comprising:
first and second flange means for securing a first member therebetween, said flange means being resiliently interconnected with one another and having slot means opening toward the location of said interconnection for slidably receiving a headed stud therealong and through said opening from said interconnection location, first surface means for engaging the surface of a support in which the stud is mounted, and second surface means for engaging the head of the stud and urging the first member toward the surface of the support in which the stud is mounted; and
locking means interconnected with said flange means and cooperating with the stud for holding said clip on the stud.

4,601,248

MINIMUM TILLAGE PLANTING APPARATUS

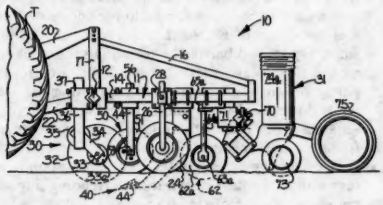
Eustace O. Beasley, Raleigh, N.C., assignor to North Carolina State University, Raleigh, N.C.

Filed Jun. 13, 1984, Ser. No. 620,118
Int. Cl.[4] A01B 49/02; A01C 5/00
U.S. Cl. 111—52 10 Claims

1. A soil conditioning apparatus, particularly useful in clay-type soil, for producing a narrow row zone of loose, soft, friable soil for the planting of seed without prior tillage and without disturbing the soil between row zones, said apparatus comprising
(a) a main frame supported for movement over the ground,
(b) a coulter supported by said main frame for rolling engagement with the ground and being adapted to cut through surface residue and slice into the soil to a predetermined depth,
(c) a plow element supported by said main frame behind said coulter and extending downwardly and forwardly to a

point behind and below said coulter and in alignment therewith, said plow element being adapted to penetrate into and lift the soil as its travels therethrough at a predetermined depth, and

(d) a pair of spaced-apart pressure means carried by said main frame on opposite sides of the rear portion of said



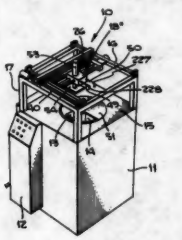
coulter and adjacent opposite sides of said plow element and directly over the point thereof for exerting a downward pressure on the soil on both sides of said plow element in opposition to the lifting action of said plow element for creating a crushing, shearing action on the soil to produce a narrow row zone of loose, soft and friable soil suitable for the planting of seed therein.

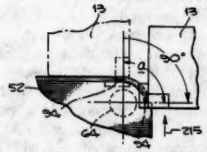
4,601,249

CLOTH STITCHING APPARATUS AND METHOD

David E. Frye, 25464 Via Adorna, Valencia, Calif. 91355

Filed Dec. 24, 1984, Ser. No. 685,998
Int. Cl.[4] D05B *3/00*
U.S. Cl. 112—121.14 **30 Claims**





1. Apparatus for forming finished sewn and hemmed edges around the border of a piece of cloth material utilizing a conventional overlock sewing machine comprising:

a main housing having a fixed top wall supported by side walls;

a rotary turntable mounted in said fixed top wall for rotation therewith;

an overlock sewing machine mounted to said turntable for rotation therewith, said sewing machine having means associated therewith for selectively hemming, stitching and cutting off excess material from a sewn piece of cloth and material;

motor means operatively coupled to said sewing machine for actuating the same:

cloth moving means associated with said housing and said turntable for selectively moving a piece of cloth material along X and Y axes over the upper surface of said top wall over to and on the upper surface of said turntable and into a position on said turntable adjacent the sewing machine;

cloth movement stopping means associated with said housing and said cloth moving means for stopping movement of a piece of cloth material when said piece of cloth material has been stitched by said sewing machine and said stitching is adjacent a corner of the cloth material; and

sewing machine turning means on said housing for turning the sewing machine about said corner of said cloth so that the stitching portion of said sewing machine stitches an arcuate seem about said corner while movement of said cloth material along the upper surface of said turntable is stopped;

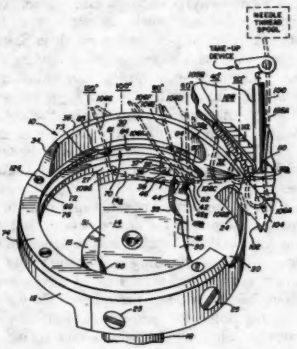
said cloth moving means including means for moving said cloth at a predetermined rate of surface speed across the upper surfaces of said turntable and said top wall and said sewing machine turning means including means for turning said sewing machine at the same predetermined rate of surface speed of said cloth moving means after stopping of said cloth moving means.

4,601,250

ROTARY LOOP TAKER FOR LOCK-STITCH SEWING MACHINE

James W. Clement, Chicago, Ill., assignor to Bakron Corp., Lakewood, Colo.

Filed Apr. 26, 1984, Ser. No. 604,327
Int. Cl.[4] D05B *57/08*
U.S. Cl. 112—184 **18 Claims**



1. A rotary loop taker for rotation about a generally cylindrical bobbin case maintained in a substantially fixed position in a lock-stitch sewing machine below the take-up device of said machine, in which sewing machine the needle provides one of the two threads that form said lock-stitch, said needle thread being taken off the needle in the form of a loop by the loop seizing point of said rotary loop taker as the loop taker rotates about the bobbin case, the vertical midsection of the side wall of said bobbin case carrying a radially extending rib for engaging the loop taker as the latter rotates about said bobbin case, which comprises:

(a) a frame of substantially annular construction, said frame having an inner wall and a predetermined inner diameter and having a cut-away portion along one segment of its circumference to provide space for the needle thread to exit from the loop seizing point of the rotary loop taker as said thread is pulled off the loop seizing point by the take-up device, said cut-away portion being defined by

opposing end walls of said frame facing upon said cut-away portion;

(b) a frame support member extending crosswise of said substantially annular frame with one edge portion of said crosswise extending support member facing said cut-away portion of said frame, said one edge portion of said crosswise extending support member and the one of said frame end walls that is at the trailing end of said cut-away portion during forward rotation of said frame defining a lug-receiving notch, said notch:

(i) having a first wall that is generally concentric with the outer circumference of said frame and at its outer end is at least as far from the center of said annular frame as the inner wall of said frame,

(ii) having a second wall that is generally radially positioned with respect to said frame, and

(iii) extending inwardly from the outer circumference of said frame, extending along said frame in an angular direction opposite to the direction of forward rotation of the frame, and extending axially entirely through said crosswise extending support member;

(c) a rotatable shaft for said annular frame attached to said frame support member and extending at generally right angles thereto for rotating said frame about said bobbin case in a predetermined plane during operation of said sewing machine;

(d) a detachable loop seizing point mounted on said frame having generally the same curvature as said substantially annular frame, said detachable loop seizing point:

(i) being integrally formed from one end to its other end;

(ii) having a single continuously tapered, smoothly shaped, integrally formed forward end, said tapered forward end having its largest transverse dimensions in a base portion and tapering to its smallest transverse dimensions at its free end;

(iii) having a supporting lug that extends directly downward into said cut-away portion of said frame, from immediately behind said base portion of said tapered forward end, into the aforesaid lug-receiving notch in nesting relationship therewith, said supporting lug having a rearwardly facing surface and an inwardly facing surface;

the rearwardly facing surface of said supporting lug abutting at all times, throughout substantially the entire height of the lug, substantially the entire forwardly facing surface of the one of said frame end walls that is at the trailing end of said cut-away portion during forward rotation of said frame.

the inwardly facing surface of said supporting lug abutting at all times substantially the entire outwardly facing surface of said first wall of the aforesaid lug-receiving notch,

said downwardly extending supporting lug forming a smoothly curved junction, free of any seams or joints, with said base portion of the tapered forward end of the loop seizing point, for guiding said loop of needle thread as it moves from the tip of said tapered forward end down to its rearwardmost position on said base portion and back to the tip again,

said rearwardmost position on the smoothly curved junction to which said needle thread loop is pulled by the rotating loop taker lying a first predetermined distance measured in any direction along said downwardly extending supporting lug from the nearest point on the crack formed by said supporting lug and said first wall of said lug-receiving notch against which said lug abuts, said first predetermined distance being at least about 1/27 of said predetermined inner diameter of said substantially annular frame, to produce a second distance measured normal to said needle thread loop between said loop and said crack that will avoid snagging the needle thread in the crack when the loop is pulled taut against said smoothly curved junction during normal operation of the sewing machine,

said downwardly extending supporting lug having a continuation portion integrally formed therewith and extending below and adjacent the bottom end of said smoothly curved junction, said curved junction merging smoothly into said continuation portion, the forward portion of said continuation portion adjacent said cut-away portion of the annular frame facing said cut-away portion in the circumferential direction with a smoothly curved, convex cross-section in any plane perpendicular to the axis of rotation of the rotary loop taker, to provide a smoothly shaped guide surface for any needle thread loop that falls slack from said tapered forward end base portion and moves downward to the lowest position it occupies during normal operation of the sewing machine, and to provide a smoothly shaped barrier to keep any such slack loop that moves downward to said lowest position from passing partly or entirely beneath said supporting lug which extends downward from said detachable loop seizing point separate from said substantially annular frame and said frame support member,

said tapered forward end of the loop seizing point extending forwardly of said downwardly extending lug into said cut-away portion of said frame; and

(iv) having a rear portion extending rearwardly of said lug along said annular frame; and

(e) means for detachably securing said loop seizing point to said frame, said means being located entirely rearward of said tapered forward end of said loop seizing point.

4,601,251

ARRANGEMENT FOR ORIENTING ROCKETS MOVING IN LIQUIDS

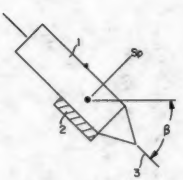
Karl Wisseroth, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,853

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125108

Int. Cl.⁴ F42B *19/01;* **F41F** *3/00;* **E21B** *29/02;* **E21C** *37/00*

U.S. Cl. 114—23 **2 Claims**



1. An improved rocket device for carrying an explosive charge to a liquid filled coal seam including a body having an axis and containing a propellant charge and an explosive charge, said improvement comprising:

a permanent magnet secured to the said rocket body at an azimuthal angle to said rocket body axis

said magnet having a magnetic moment great than 5.10^{-7} volts second meter sufficient with respect to the weight of said rocket to orient the said rocket body at a corresponding angle to the north-south magnetic meridian when said body is suspended in said liquid, and said magnet being manually movable lengthwise of the rocket device so as to be positioned on said body in the direction of said axis to displace the center of gravity of the said rocket and magnet to adjust an angle of elevation of said rocket body axis in said liquid.

4,601,252

TURRET FOR MOORING VLCC SIZE VESSELS

Hermann Wuttudal, 830 Nantucket, Beaumont, Tex. 77706

Filed Jan. 3, 1984, Ser. No. 567,744

Int. Cl.⁴ B63B *21/00*

U.S. Cl. 114—230 **32 Claims**

1. An improved turret rotatable about a vertical axis within

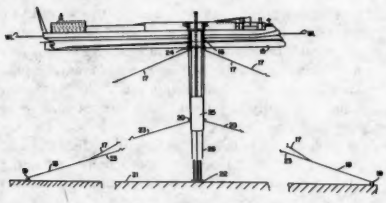
a support and adapted to operate subject to differential lateral and vertical loading, the improved turret comprising:

(a) a cylindrical spool carrying at least one radial bearing disk, and a round vertical body rotatable about the vertical axis;

(b) a supporting base adapted to receive said tubular spool within a defining enclosed wall;

(c) a stiff liner mounted within said supporting base in spaced relationship to said disk and said round body;

(d) an elastic medium positioned between said liner and said supporting base coextensive with said disk;



(e) a plurality of annular metal stop members mounted between said liner and said disk for spacing same a minimum distance apart;

(f) said disk carrying radial skirts for throttling liquid outlets between said disk and said liner and extending between said stop members for defining a plurality of annular segmented cups encircling said disk; and

(g) source means for introducing pressurized liquid into each segmented cup for maintaining said spool balanced in vertical range and segmented with its vertical axis of rotation in said base.

4,601,253

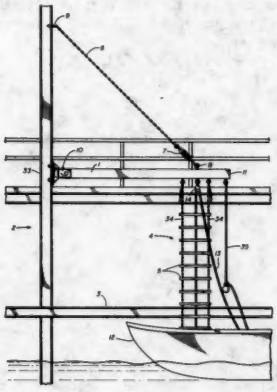
OFFSHORE BOARDING APPARATUS

Robert A. Anders, 6725 Brittmore, Houston, Tex. 77041

Filed Jun. 24, 1985, Ser. No. 747,798

Int. Cl.[4] B63B *17/00*

U.S. Cl. 114—362 **6 Claims**



1. An apparatus for boarding or leaving an offshore structure located in the water such as a drilling platform or ship said offshore structure having a landing platform and vertical support members, said apparatus comprising:

(a) a horizontal support beam having an attachment end and a free-swinging end rotatably attached at said attachment end to one of said vertical support members by a pivot means defining a vertical pivot axis and supported near said free swinging end by a cable, chain or the like one end of which is fixedly attached to said beam near said free-swinging end and the other end being fixedly attached to said vertical support member above said pivot means;

(b) a flexible ladder fixedly attached near said free end and extending downward to the water level;

(c) a pulling means attached to said beam and accessible to a boat adjacent to said structure for pivoting said support beam out and away from said offshore structure over the water; and

(d) a self-returning means for automatically returning said free end towards the offshore structure and holding it securely against said offshore structure above said landing platform.

4,601,254

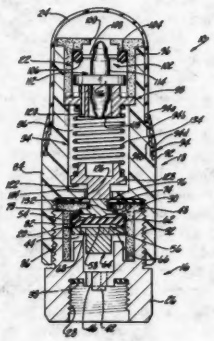
TIRE PRESSURE WARNING DEVICE

Chung-Siung Huang, and Hsien-Ching Kuo, P.O. Box 87-462, both of, Taipei, Taiwan

Filed Mar. 24, 1983, Ser. No. 478,321

Int. Cl.[4] B60C *23/04*

U.S. Cl. 116—34 R **7 Claims**



1. In a tire pressure warning device of the type comprising:

a body adapted to be threaded onto the filler valve stem of a tire and to open the tire valve therein and admit pressurized air from the tire to an inlet passage in said body,

a pressure sensing valve in fluid communication with said inlet passage, the pressurized air therein tending to close said sensing valve,

actuating means acting on the sensing valve to open it when the pressure of the pressurized air is below a predetermined value whereby air from the tire is allowed to flow through the sensing valve to an outlet passage in said body,

and alarm means in fluid communication with the the outlet passage and adapted to produce an alarm signal in response to flow of air through the sensing valve,

the improvement wherein,

said sensing valve comprises an annular valve seat and a valve element including a distendable resilient diaphragm peripherally bounded by an annular sealing rim adapted to engage said valve seat, said pressurized air exerting a force on said diaphragm and said sealing rim tending to close said valve, said actuating means exerting a resilient bias force on only a central portion of said diaphragm tending to distend said diaphragm and move said sealing rim away from said valve seat to thereby open said valve,

whereby progressively decreasing values of said pressure from a threshold value causes said diaphragm to be progessively distended without opening said valve until said pressure decreases below a predetermined value.

4,601,255

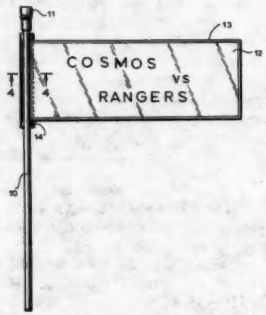
FLAGPOLE DEVICE

Ettore Marcotti, 28 Cleveland Pl., Palisades Park, N.J. 07650

Filed Aug. 27, 1984, Ser. No. 644,352

Int. Cl.[4] G09F *17/00*

U.S. Cl. 116—173 2 Claims



1. A signal flag comprising:

an elongated flag staff having a plastic cap at one end thereof and having a circular cross-section;

an elongated hollow transparent flat generally waterproof envelope made of a plastic material and having a width smaller than the length of the flag staff and open at one end thereof;

a flag comprising a bumper sticker removably inserted into said envelope, said bumper sticker having printed matter on one side thereof, all of which may be seen when said bumper sticker is contained within said envelope and said bumper sticker having adhesive material on the opposite side thereof to allow the bumper sticker when removed from said envelope to be applied to a vehicle; and

a semicircular spring-loaded removable plastic clip having a diameter slightly smaller than said staff releasably clamping the open end of said transparent envelope in a sealed manner to said staff adjacent to said cap thereof.

4,601,256

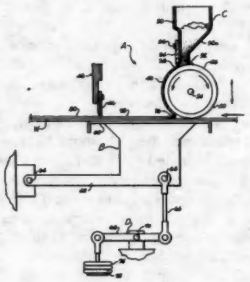
APPARATUS AND METHOD FOR UNIFORMLY COATING AN IRREGULAR WEB

Robert J. Poterala, c/o Mascoe Systems Corporation, Box 370, Mauldin, S.C. 29662

Filed Aug. 3, 1984, Ser. No. 637,448

Int. Cl.[4] B05C *1/08, 11/04, 3/18;* B29B *1/00*

U.S. Cl. 118—126 9 Claims



1. Apparatus for coating a web of material with a coating medium comprising:

a frame;

a vertically moving pressure table carried by said frame for supporting said web being coated in up or down vertical directions;

a transfer roll carried adjacent said pressure table for applying said coating medium to said web passing over said pressure table;

application means for applying said coating medium to said transfer roll;

a vertically adjustable scrape blade carried by said frame downstream of said transfer roll adjacent said pressure table for contacting said web to cause spreading of said coating medium over said web and penetration into said web;

said pressure table generally coextending beneath said transfer roll and said scrape blade means in length and across at least the width of said web in a manner that said pressure table uniformly urges said web against said scrape blade and said transfer roll;

adjustable counterbalance means including a counter balanced linkage arm pivotably connected to said pressure table and said frame for exerting a constant uniform counterbalancing force on said pressure table in said up or down vertical directions in a manner in which a web having thickness and density variations traveling over said pressure table is held against said scrape blade and said transfer roll with constant and uniform pressure regardless of whether said pressure table moves vertically up or down in response to said thickness and density variations and surface irregularities in said web;

a weight assembly connected to said counterbalanced linkage arm in a manner that a desired amount of said counter balancing force may be applied to said pressure table in a counter balancing manner,

whereby a smooth and uniform coating is applied to said web regardless of said variations and irregularities.

4,601,257

ADHESIVE APPLICATOR DEVICE IN A CEMENT LASTING MACHINE

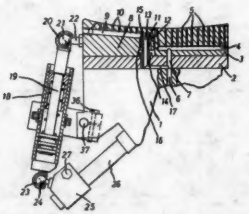
Gerhard Giebel, Bad Soden, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 597,476, Apr. 6, 1984, abandoned. This application Jun. 19, 1985, Ser. No. 746,449

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311940

Int. Cl.[4] B05C *5/02, 5/04*

U.S. Cl. 118—411 3 Claims



1. A machine for lasting shoes wherein the lasting margin of a lasted shoe upper is secured to the margin of the insole by means of adhesive supplied to the forepart of the shoe bottom, comprising an adhesive applicator element including aperture means for delivering adhesive to the forepart of the shoe bottom,

first and second adhesive applicator rail means adjacent to and extending heelwardly from either side of said adhesive applicator element,

carrier plate means having first and second ball joint means for supporting the toe end of said first and second adhe-

sive applicator rail means whereby said first and second adhesive application rail means can each be pivotally displaced about a first axis parallel to the insole and about a second axis perpendicular to the insole,

first and second cylinder means,

ball joint means for connecting one end of each of said cylinder means to the heel end of a respective one of said first and second adhesive applicator rail means whereby each of said first and second adhesive applicator rail means, when brought into engagement with an insole, can automatically reorient about a third axis extending between the ball joint means at either end thereof to establish mating contact with the insole,

ball joint means for connecting the other end of each of said cylinder means to said carrier plate means,

cylinder mounting means including cylinder plate means,

mean for mounting said cylinder mounting means on said carrier plate means for displacement in a selected direction,

means for displacing said cylinder mounting means in said selected direction,

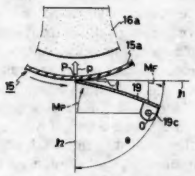
means for mounting each of said cylinder means on said cylinder plate means for limited pivotal movement relative thereto, whereby each of said cylinder means may reorient relative to said cylinder plate means during the displacement of said cylinder mounting means.

4,601,258

ELECTROPHOTOGRAPHIC DEVELOPING DEVICE HAVING TONER REMOVING MEANS

Shiroh Kondoh, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 24, 1984, Ser. No. 653,940
Claims priority, application Japan, Sep. 22, 1983, 58-174321
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—652 **10 Claims**



1. A device for developing a latent image formed on an image bearing member by applying a developer thereto as a developing station, comprising:

first transporting means for transporting said developer as carried thereon along a predetermined path including said developing station;

first attracting means for attracting said developer to said first transporting means, said first attracting means producing a magnetic field;

first film forming means disposed upstream of said developing station with respect to the direction of transportation of said toner for forming a film of said developer having a predetermined thickness and charge, said film of developer being applied to said image bearing member at said developing station for development of said latent image; and

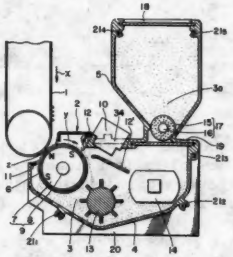
removing means disposed downstream of said developing station with respect to the direction of transportation of said toner for removing the developer remaining on said first transporting means after development at said developing station, said removing means being pivotally supported and normally pressed against said first transportion means as magnetically attracted by said attracting means.

4,601,259

DEVELOPING APPARATUS

Keitaro Yamashita, Saitama, Japan, assignor to Kentek Information Systems, Inc., Allendale, N.J.

Filed Aug. 1, 1984, Ser. No. 636,840
Claims priority, application Japan, Aug. 3, 1983, 58-142128
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—658 **2 Claims**



1. A developer apparatus capable of being installed into and removed from an electrophotographic recording system as a single unit, said developer unit comprising

a developer tank for storing a developer comprising a mixture of magnetic carrier and toner, the toner content of said mixture being set at a predetermined level before said developer apparatus is installed in said electro-photographic recording system;

a toner tank for storing said toner, said toner tank being formed integrally with said developer tank so that the developer apparatus may be installed and removed as a single unit, said toner tank having a toner outlet communicating with said developer tank, a toner replenishing movable member being positioned at said outlet for controlling the flow of toner from said toner tank to said developer tank;

a developer mixing moving member positioned inside said developer tank,

a rotatable non-magnetic sleeve for applying said developer to a photoconductive means carrying a latent electrostatic image, said sleeve being positioned in an opening of said developer tank, and

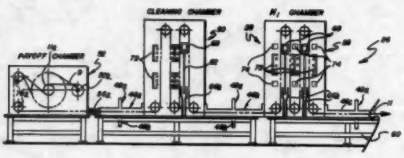
a permanent magnetic member disposed in said magnetic sleeve, said permanent magnetic member comprising a plurality of magnetic poles,

said developer apparatus further comprising first openable means for sealing the outlet between said toner tank and said developer tank before said developer apparatus is installed in said recording system, second openable sealing means for sealing said opening of said developer tank in which said sleeve is positioned before said developer apparatus is installed in said recording system, and releasable locking means for locking said toner replenishing member, said developer mixing member, and said non-magnetic sleeve prior to installing said development unit to prevent said predetermined level of toner from substantially changing prior to installation of said developer apparatus, so that said developer apparatus may be used immediately upon installation, said developer apparatus being abandoned as a single unit after the magnetic carrier component of said developer has reached the end of its predetermined life.

4,601,260
VERTICAL SEMICONDUCTOR PROCESSOR

Herbert Ovshinsky, Oak Park, Mich., assignor to Sovonics Solar Systems, Troy, Mich.

Filed Apr. 1, 1985, Ser. No. 718,571
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—718 21 Claims



1. Apparatus for the continuous vapor deposition of semiconductor alloy material, said apparatus including:

a plurality of discrete chambers, each chamber dedicated to the vapor deposition of semiconductor alloy material of a preselected conductivity type;

means for vacuumizing each of the chambers;

means for continuously advancing a substrate through each of the chambers;

each chamber including means adapted for the glow discharge deposition of semiconductor alloy material, said deposition means including (1) means for introducing a precursor mixture of process gases; (2) means for exhausting nondeposited gases of the precursor mixture; and (3) means for decomposing the precursor mixture in a plasma region;

means for isolating the gaseous environments of adjacent discrete deposition chambers while providing for the passage of the substrate therebetween; the improvement comprising, in combination:

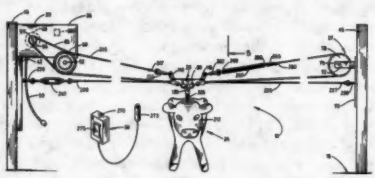
the advancing means including means for directing the substrate through at least one of the chambers in a non-linear path of travel;

the decomposing means operatively structured and disposed so as to develop a plurality of plasma regions in the chambers through which the substrate is non-linearly directed; at least two of the plurality of plasma regions disposed in different non-linear portions of the path of travel through which the substrate is advanced, whereby the total length of the apparatus may be substantially foreshortened, gas utilization and the throughput of the apparatus may be substantially increased and power consumption in developing the plasma may be substantially decreased.

4,601,261
APPARATUS FOR ELICITING RESPONSES BY ANIMALS TO MOVING, VISUALLY DISCERNIBLE STIMULI

Gregory U. Genelin, 14788 Sky View Rd., Madera, Calif. 93638

Filed Jan. 22, 1985, Ser. No. 693,667
Int. Cl.[4] A01K *15/02*
U.S. Cl. 119—29 14 Claims



1. A device for providing a visual stimulus discernible by a horse surmounted by a rider comprising:

a visually discernible target;

carrier means elevated relative to a ground surface for supporting the target in an elevated attitude;

motive means for imparting motion to the carrier means to move the target in a selected direction:

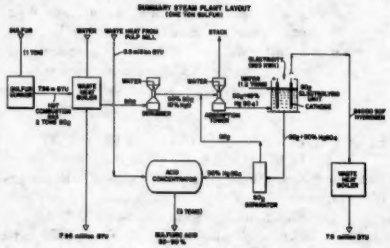
a mounting member secured to the target to support the target in depending relation therefrom and for movement therewith, the mounting member being responsive to movement of the carrier means to cause the target to be oriented in a selected attitude relative to the direction of movement of the target; and

control means for selectively causing the motive means to operate and to cease operating.

4,601,262
ENERGY BALANCE PROCESS FOR THE PULP AND PAPER INDUSTRY

Dallas W. Jones, 2773 Johnson Rd., Germantown, Tenn. 38138

Filed Mar. 28, 1984, Ser. No. 567,941
Int. Cl.[4] F22D *1/00*
U.S. Cl. 122—7 R 2 Claims



1. A pollution free process for the production of steam and energy by the burning of sulfur and an electrolysis of the by-products of burning sulfur mixed with water comprising the steps of: burning a requisite amount of sulfur in a sulfur burner to produce hot combustion gas and sulfur dioxide; passing said hot combusion gas and said sulfur dioxide directly through a waste heat boiler in addition to water provided from a source and utilizing the heat exchange between said hot combusion gas, said sulfur dioxide, and said water to produce steam, cooled sulfur dioxide, and cooled combustion gases; passing said cooled sulfur dioxide while supplying water to a closed scrubber used only to mix said cooled sulfur dioxide with said supplied water to provide a constant feedstream of about 90% sulfur dioxide and about 10% water without losing any sulfur dioxide to the environment; passing said feedstream to an absorption tower while supplying additional water to obtain a mixture of about 49% sulfur dioxide and sulfuric acid; passing said mixture into a sulfur dioxide electrolysis unit to produce hydrogen and by-products consisting of a second mixture of sulfur dioxide and sulfuric acid; burning said hydrogen produced in said process to further produce energy in the form of steam or for use as direct heat.

4,601,263
APPARATUS FOR SUPPLYING BOILED WATER

Tzyy D. Shieh, No. 7, La. 348, Sec. 2, Chang Nan Rd., Hsang San Li, Chang Hua, Taiwan

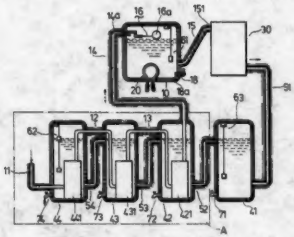
Filed Jun. 28, 1985, Ser. No. 750,750
Int. Cl.[4] F22B *5/00*
U.S. Cl. 122—13 A 10 Claims

1. A boiled water supplying apparatus comprising:

a water heating closed tank having a bottom, a top and a side wall, said wall being provided with a first water inlet and a first water outlet which is located at a level lower than that of said water inlet;

a first conduit having one open end thereof connected to said first water outlet and the other open end thereof arranged at a level higher than said first water outlet;

a water level regulating means for maintaining the water level in said water heating tank at a level lower than that of said other open end of said first conduit, said regulating



means including a valve means for regulating the water flow through said first water inlet and a float body connected to said valve means; and

a heating unit provided in said water heating tank for boiling the water; whereby the water can only be forced to flow out of said water heating tank by the vapor pressure of the boiling water.

4,601,264

COOLING SYSTEM FOR AUTOMOTIVE ENGINE

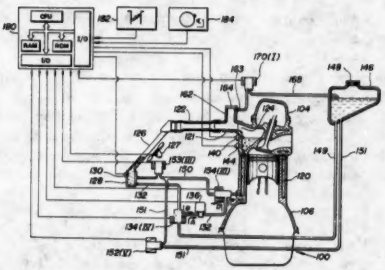
Yoshinori Hirano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed May 16, 1985, Ser. No. 734,696

Claims priority, application Japan, May 18, 1984, 59-100156

Int. Cl.[4] F01P 3/22

U.S. Cl. 123—41.27 **11 Claims**



1. In an internal combustion engine:

a structure subject to high heat flux; and

a cooling system comprising:

a cooling circuit which includes:

(a) a coolant jacket formed about said structure subject to high heat flux and into which coolant is introduced in liquid form, permitted to boil and discharged in gaseous form,

(b) a radiator exposed to a cooling medium which can remove heat from said radiator,

(c) a vapor transfer conduit leading from said coolant jacket to said radiator for transfering gaseous coolant from said coolant jacket to said radiator for condensation therein, and

(d) means for returning coolant condensed to its liquid state in said radiator to said coolant jacket in a manner to maintain said structure immersed in a predetermined depth of coolant;

a first sensor for sensing a parameter which varies with the temperature of the coolant in said coolant jacket;

a second sensor for sensing a parameter which varies with load on said engine;

a reservoir containing liquid coolant;

valve and conduit means for controlling fluid communication between said reservoir and said cooling circuit;

a device for increasing the rate of heat exchange between the cooling medium and said radiator; and

a control circuit responsive to the outputs of said first and second sensors, said control circuit including means for:

(a) controlling said valve and conduit means in a manner to control the amount of liquid coolant in said radiator and therefore the amount of surface area via which the latent heat of evaporation of said coolant vapour can be released, and

(b) controlling said device in a manner to vary the rate of heat exchange between said radiator and the cooling medium.

9. A method of controlling an internal combustion engine comprising the steps of:

introducing liquid coolant into a coolant jacket formed about structure of said engine subject to high heat flux;

permitting the coolant to boil;

condensing the gasesous coolant to its liquid form in a radiator exposed to a cooling medium;

sensing a first parameter which varies with the temperature of the coolant in said coolant jacket;

sensing a second parameter which varies with load on the engine;

storing liquid coolant in a reservoir;

controlling communication between said reservoir and said coolant jacket using valve and conduit means

controlling said valve and conduit means in a manner to:

(i) control the amount of liquid coolant in said radiator and thus the surface area thereof via which the latent heat of evaporation of said coolant can be release to the cooling medium;

(ii) controlling a device associated with said radiator in a manner to vary the heat exchange between said radiator and the cooling medium.

4,601,265

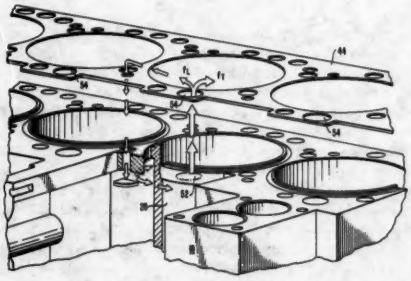
INTERNAL COMBUSTION ENGINE WITH IMPROVED COOLANT ARRANGEMENT

Larry Wells; Nigel Gale, both of Columbus, and J. Dan Baugh, Greensburg, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 28, 1985, Ser. No. 749,743

Int. Cl.[4] F01P 3/02

U.S. Cl. 123—41.28 **17 Claims**



1. An internal combustion engine with a cylinder block having a line of cylinders and a cylinder head attached to a top surface of the cylinder block with a head gasket therebetween, longitudinally extending coolant distribution and discharge

manifolds being provided adjacent each other on one side of the cylinder block, and coolant circuit means for circulating a liquid coolant from the distribution manifold through the cylinder head, from the cylinder head to coolant chambers surrounding each of the cylinders in said cylinder block and from said coolant chambers to the discharge manifold, wherein said coolant circuit means comprises a row of intake passages connecting the distribution manifold with the interior of the cylinder head, each of said intake passages being located in association with a respective one of said cylinders on one side thereof, coolant flow paths through the cylinder head for directing coolant from said intake passages longitudinal and transversely through the cylinder head to outlet flow passages connecting the interior of the cylinder head with a top portion of coolant chambers surrounding each of said cylinders at a laterally opposite side of said cylinders from the side with said intake passages, and outlet openings connecting a bottom portion of said coolant chambers with said discharge manifold.

4,601,266

PHASING DEVICE FOR MACHINE APPLICATIONS

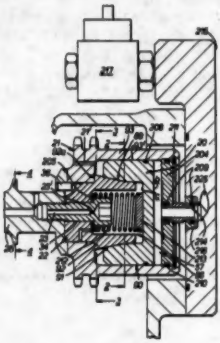
Benjamin D. Oldfield, Cheadle; Phillip J. Owen, Stockport, and Colin Hague, Worsley, all of England, assignors to Renold PLC, Manchester, England

Filed Dec. 18, 1984, Ser. No. 682,793

Claims priority, application United Kingdom, Dec. 30, 1983, 8334619; Nov. 12, 1984, 8428578

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.15 **17 Claims**



1. An infinitely variable phase adjuster comprising a rotatable member adapted to be driven in rotation from a drive shaft in a fixed angular relationship therewith, a further member connectible to drive a further shaft in a fixed angular relationship therewith and drive transmission means connected to drive said further member in rotation from said rotatable member, said drive transmission means including a pressure fluid operable member displaceable axially with respect to said rotatable member and said further member and rotatable therewith and cam means adapted progressively to rotate said further member relative to said rotatable member with axial displacement of said axially displaceable member relative thereto, the cam means comprising radially directed, helically twisted, drive transmitting surfaces on said pressure fluid operable member arranged in confronting, drive transmitting relation with corresponding helically twisted, drive transmitting surfaces on one of said rotatable and further members respectively.

4,601,267

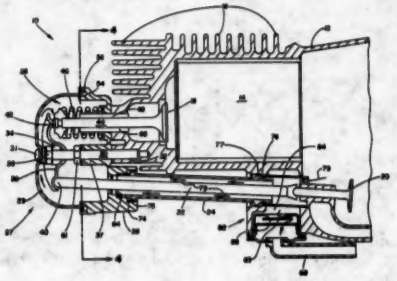
VALVE MECHANISM LUBRICATION SYSTEM FOR AN OVERHEAD VALVE ENGINE

Peter G. Kronich, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jul. 26, 1985, Ser. No. 759,659

Int. Cl.[4] F01M *13/00, 11/02*

U.S. Cl. 123—90.33 **15 Claims**



1. In an internal combustion engine, including a crankcase, an oil sump, a plurality of push rods for operating the valves of the engine, a rocker box for housing the valve actuating mechanism, a lubrication system for lubricating the valve actuating mechanism comprising:

a first hollow tube for housing a first of said push rods, said first tube having one end open to said crankcase, and an opposite end open to said rocker box, for conducting oil mist from said crankcase to said rocker box to lubricate said valve rocker mechanism;

a second hollow tube for housing a second said push rod, said second tube having one end open to said rocker box and an opposite end open to a breather chamber for conducting liquid oil and oil mist from said rocker box to said breather chamber, said breather chamber being vented to the atmosphere;

an oil drain passage for conducting liquid oil from said breather chamber to said oil sump; and

baffle means in said rocker box for causing said oil mist entering said rocker box from said first tube to flow past said valve actuating mechanism for lubrication thereof before flowing from said rocker box into said second tube.

4,601,268

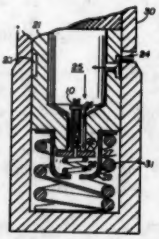
VARIABLE TWO-WAY BLEED VALVE

Gary E. Rhoads, 8565 Boulder Dr., La Mesa, Calif. 92041

Filed Feb. 27, 1984, Ser. No. 583,997

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.55 **4 Claims**



1. A hydraulic valve lifter comprising:

a hollow tubular body closed at its bottom end, said tubular body having a predetermined internal diameter;

a slidable plunger having an external diameter slightly smaller than the internal diameter of said tubular body, said plunger having a hydraulic fluid chamber formed therein, a valve seat formed on a bottom surface of said plunger, a bore hole connecting said valve seat with said hydraulic fluid chamber, said plunger being slidably supported within said tubular body at a position spaced from said bottom end thereby forming a hydraulic fluid pressure chamber between the plunger and the bottom end of said tubular body;

means for supplying hydraulic fluid from the outside of said hollow tubular body to the hydraulic fluid chamber inside said plunger;

valve means extending into said bore hole having an internal bypass passage and also seatable against said valve seat for varying engine valve timing automatically by increasing valve lash at low speeds, thus improving low end torque horsepower, and which when the engine speed increases it decreases valve lash, consequently lengthening valve duration and overlap, thus improving high speed performance wherein said bypass passage allows fluid passage therethrough when said valve is in a seated position;

a perforated retaining cage is positioned against the bottom of said plunger, a return spring has its top end in contact with said retaining cage and its bottom end in contact with the bottom end of said tubular body; and

a valve spring having its top end pressed against said valve means and its bottom end pressed against said retaining cage.

4,601,269

FUEL INJECTION NOZZLE

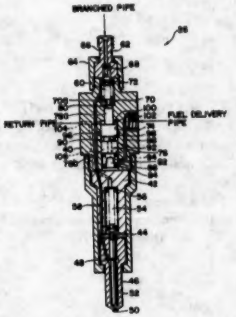
Masaaki Kato, Kariya; Shigeki Tojo, Mie, and Kazuyoshi Arai, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 24, 1985, Ser. No. 748,397

Claims priority, application Japan, Jun. 27, 1984, 59-132346

Int. Cl.⁴ F02M *59/34*

U.S. Cl. 123—300 **9 Claims**



1. A fuel injection nozzle connected to a fuel injection pump to inject fuel into a combustion chamber of an internal combustion engine, comprising:

a nozzle housing defining therein a fuel sump chamber, an injection hole communicating with the sump chamber and opened at the outer surface of the nozzle housing, a stepped cylinder bore having a smaller diameter bore section and a larger diameter bore section and a fuel passage communicating at one end with the sump chamber and at the other end with the smaller diameter bore section of the stepped cylinder bore;

a stepped plunger fitted in the stepped cylinder bore and having a smaller diameter plunger section fitted into the smaller diameter bore section and a larger diameter plunger section fitted into the larger diameter bore section in which the smaller diameter bore section together with the end face of the smaller diameter plunger section defines a pump chamber communicating with the fuel passage and the larger diameter bore section together with the end face of the larger diameter plunger section defines a main fuel chamber into which a main fuel is supplied from the fuel injection pump;

auxiliary fuel supply means for supplying an auxiliary fuel into the sump chamber and pump chamber through the fuel passage;

valve means for opening and closing an injection hole, the valve means including a nozzle needle slidably disposed within the nozzle housing and responsive to a fuel pressure in the sump chamber to cause it to be lifted to permit the injection hole to be opened and a pressure spring for urging the nozzle needle under a predetermined force in a direction in which the injection hole is blocked, the urging force of the pressure spring being set to be greater than the pressure of the auxiliary fuel supplied from the auxiliary fuel supply means and smaller than the pressure of the main fuel supplied from the fuel injection pump; and

communication means for permitting the main fuel chamber to communicate with the fuel passage when the main fuel is supplied from the injection pump into the main fuel chamber to cause the stepped plunger to be moved a predetermined distance in a direction in which the auxiliary fuel in the pump chamber is pressurized.

4,601,270

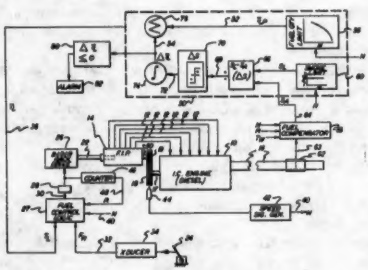
METHOD AND APPARATUS FOR TORQUE CONTROL OF AN INTERNAL COMBUSTION ENGINE AS A FUNCTION OF EXHAUST SMOKE LEVEL

John A. Kimberley, East Granby, and Robert H. Bullis, Avon, both of Conn., assignors to United Technologies Diesel Systems, Inc., Springfield, Mass.

Filed Dec. 27, 1983, Ser. No. 566,001

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—357 **11 Claims**



1. Apparatus for controlling the maximum fuel supply quantity to an internal combustion engine emitting an exhaust gas stream which may contain electrically-charged particulate, including fuel supply means responsive to a fuel quantity demand input and to a fuel quantity limit signal for supplying to the engine the demanded quantity of fuel within the quantity limit, comprising:

a probe adapted to be mounted in operative association with the exhaust gas stream at a sensing station downstream of the engine for inductively sensing the electrically charged particulate in the exhaust gas stream to provide an electrical signal indicative of the particulate level in the exhaust gas stream;

circuit means responsive to said electrical signal indicative of the particulate level in the exhaust gas stream and to a

predetermined correlation between a said particulate level signal and an opacity-derived smoke level signal for providing a sensed smoke level signal scaled to an opacity-derived smoke value, said predetermined correlation between a said particulate level signal and an opacity-derived smoke level signal being determined for a particular fuel and wherein said circuit means is further responsive to a predetermined set of engine operating conditions each time the engine is operated to modify said predetermined correlation as needed to compensate for variations in engine fuel characteristics;

means for providing said fuel quantity demand input; and

signal generating means responsive to engine operating condition signals including at least said sensed smoke level signal for providing said fuel quantity limit signal.

4,601,271

THROTTLE VALVE CONTROLLING APPARATUS

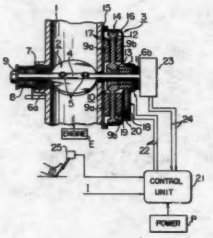
Yuuki Ejiri; Tomoo Ito, and Hiroshi Kamifuji, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,726

Claims priority, application Japan, Mar. 9, 1984, 59-43946

Int. Cl.[4] F02D *41/00*

U.S. Cl. 123—361 **3 Claims**



1. An apparatus for controlling an opening degree of a throttle valve fixed to a throttle valve shaft for swing movement around an axis of said throttle valve shaft so as to control an air-fuel mixture flow to be supplied to an engine, the apparatus comprising:

a motor including a rotor portion which is associated with said throttle valve shaft to swing said throttle valve;

means for detecting an amount of swing movement of said throttle valve and for producing a signal corresponding to the opening degree of said throttle valve;

a control unit for receiving and judging said signal from the detecting means and for outputting a command to said motor so as to swing said throttle valve in a desired opening degree;

a one piece throttle valve shaft on which said throttle valve and said rotor portion of said motor are separately disposed; and

wherein said rotor portion and said one piece shaft are molded together.

4,601,272

IGNITION TIMING CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

Masaaki Nagai, Hachiouji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1985, Ser. No. 764,897

Claims priority, application Japan, Aug. 16, 1984, 59-171268

Int. Cl.[4] F02D *41/26*

U.S. Cl. 123—425 **2 Claims**

1. An ignition timing control system for an automotive engine, comprising:

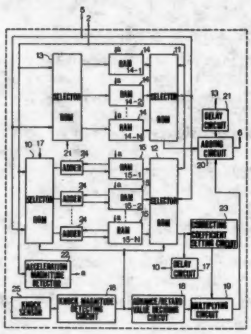
means for detecting driving conditions of a motor vehicle driven by the engine and for producing a driving condition signal;

first circuit means responsive to the driving condition signal for deciding ignition timing;

detecting means for detecting the magnitude of the acceleration of the engine and for producing an acceleration signal;

knock detecting means for detecting knock of the engine and for producing a knock signal the level of which is dependent on the magnitude of the knock;

second circuit means responsive to the knock signal for producing an advance/retard signal;



correcting circuit means for correcting the advance/retard signal;

a plurality of first areas in a memory for storing advance/retard correcting values;

first selecting circuit means for designating one of the first areas in the memory in accordance with the driving condition signal and the acceleration signal and for storing an advance/retard signal corrected by the correcting circuit means;

second selecting means for deriving the corrected advance/retard signal from a designated area in the first areas and for sending it to the correcting circuit means so as to correct the advance/retard signal.

4,601,273

AIR/FUEL RATIO MONITORING SYSTEM IN IC ENGINE USING OXYGEN SENSOR

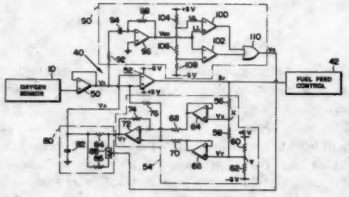
Tsuyoshi Kitahara, Yokohama, Japan, and Kohki Sone, Ann Arbor, Mich., assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 27, 1984, Ser. No. 655,225

Claims priority, application Japan, Sep. 29, 1983, 58-181397

Int. Cl.[4] F01N *3/20*

U.S. Cl. 123—440 **8 Claims**



1. A system for monitoring the air/fuel ratio of an air-fuel mixture supplied to an internal combustion engine, said system comprising:

a concentration cell type oxygen sensor means disposed in an

exhaust passage of the engine, said oxygen sensor having a laminate of an inner electrode layer, a microscopically porous layer of an oxygen ion conductive solid electrolyte, and an outer electrode layer exposed to exhaust gas, said sensor means producing an output which becomes a high-level voltage signal when the air/fuel ratio is below the stoichiometric ratio of said air-fuel mixture, and which becomes a low-level voltage signal when the air/fuel ratio is above said stoichiometric ratio;

judgement means for producing an air/fuel ratio signal which indicates whether the air/fuel ratio is above or below said stoichiometric ratio by comparing said output of said oxygen sensor with a reference voltage;

modulating means for producing a modulated voltage signal by subtracting a first fixed voltage from said output of said oxygen sensor when said air/fuel ratio signal indicates that the air/fuel ratio is below said stiochiometric ratio and by adding a fixed definite voltage to said output of said oxygen sensor when said air/fuel ratio signal indicates that the air/fuel ratio is above said stoichiometric ratio; and

smoothing means, having a variable time constant, for smoothing said modulated voltage signal to thereby produce a smoothed voltage and for supplying said smoothed voltage to said judgement means as said reference voltage;

control means for varying the time constant of said smoothing means as a function of a change in said output of said oxygen sensor.

4,601,274

FUEL PUMPING APPARATUS

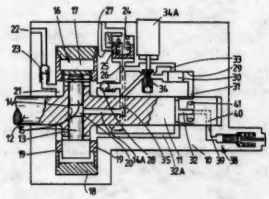
Alec H. Seilly, North Wembley, England, assignor to Lucas Industries, Birmingham, England

Filed Jul. 10, 1985, Ser. No. 753,372

Claims priority, application United Kingdom, Jul. 13, 1984, 8417862

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—450 **12 Claims**



1. A fuel pumping apparatus for supplying fuel to a combustion chamber of a compression ignition engine comprising in combination, a pumping plunger housed within a bore, means driven by a drive shaft which is connected in use to or forms part of a rotary part of the engine for positively reciprocating the plunger within the bore, the bore defining with the plunger first and second pump chambers, the volume of the second chamber increasing and that of the first chamber decreasing during movement of the plunger in a fuel delivery direction and vice versa as the plunger is moved in the opposite fuel filling direction, a shuttle slidable within a cylinder, an outlet from one end of the cylinder for connection in use to a fuel injection nozzle of the associated engine, a fuel inlet to said second chamber, a first non-return valve in said fuel inlet arranged to allow fuel flow into said second chamber, an accumulator in which fuel can be stored under pressure, a second non-return valve in a conduit connecting said second chamber with said accumulator, first valve means operable to connect said second chamber with said one end of the cylinder whereby during movement of the plunger in the filling direction fuel will flow to said one end of the cylinder and displace said shuttle, said second non-return valve being set to open at a higher pressure than is required to cause movement of the shuttle, an electromagnetically operated valve connected in a flow path between the other end of the cylinder and the accumulator, said electromagnetically operable valve being operable to prevent escape of fuel from the other end of the cylinder during movement of the shuttle away from said one end of the cylinder thereby to determine the excursion of the shuttle, second valve means operable to connect said first chamber with said accumulator during movement of the pumping plunger in the filling direction and third valve means operable to connect said first chamber with the other end of the cylinder during movement of the pumping plunger in the pumping direction.

4,601,275

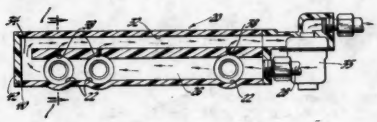
FUEL RAIL

Louis H. Weinand, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1982, Ser. No. 410,611

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—468 **1 Claim**



1. A fuel rail for an engine, said rail comprising an elongated body having a plurality of axially spaced transversely extending fuel injector sockets and a pair of transversely spaced axially extending fuel passages, said fuel passages being interconnected at one end of said body for fuel flow through said passages in series, one of said passages intersecting said sockets for supplying fuel to said sockets, each of said sockets being adapted to receive a fuel injector suitable for delivering fuel from its socket to the engine, and wherein at least one end of said body has a circular recess intersected by and encompassing the associated ends of said fuel passages, and a circular plug is received in and seals said recess to provide a closure for the associated ends of both of said passages.

4,601,276

METHOD OF AND DEVICE FOR REGULATING FUEL-AND-AIR MIXTURE SUPPLIED TO AN INTERNAL COMBUSTION ENGINE

Eckart Damson, Stuttgart; Horst Franke, Löchgau; Helmut Maurer, Vaihingen; Klaus Müller, Tamm, and Franz Rieger, Aalen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,999

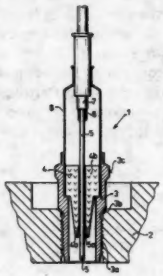
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1982, 3238753

Int. Cl.[4] F02M *51/00, 7/12*

U.S. Cl. 123—489 **3 Claims**

1. A method, of regulating fuel-and-air mixture supplied to a combustion chamber of an internal combustion engine via a mixture-preparing device cooperating with an oxygen probe which is placed directly in the combustion chamber to deliver an output signal indicative of the actual amount of oxygen in the mixture, comprising the steps of evaluating the output signals according to their shape denoting either rich or lean ratio mixtures in each cycle, then applying the signals of one kind to at least one counter and after the runoff of a predetermined number $N>1$ of engine cycles, computing the difference between the two kinds of signals and computing the average actual λ value, and further comprising the step of

determining a new actual λ value of the mixture in a cycle, prior to the expiration of the predetermined number N of



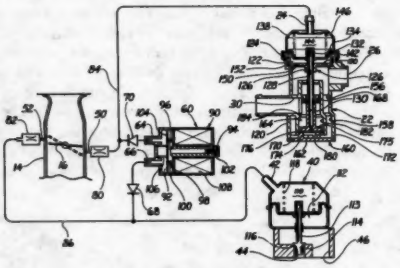
engine cycles when a predetermined number n_f and n_m of rich or lean consecutive cycles has occurred.

4,601,277

SYSTEM FOR COMBINED EGR AND IDLE SPEED CONTROL

John E. Cook, Chatham, Canada, assignor to Canadian Fram Limited, Chatham, Canada

Filed Jun. 25, 1984, Ser. No. 624,162
Int. Cl.⁴ F02M *25/06*
U.S. Cl. 123—571 **11 Claims**



1. In a system including a throttle body communicating intake air to an intake manifold of an engine, the throttle body including a movable throttle plate, a first vacuum responsive valve, and a second vacuum responsive valve;

means responsive to the position of said throttle plate for communicating vacuum manifold pressure to one of either of said first or said second vacuum responsive valves and for communicating atmospheric pressure to the other of said first or second vacuum responsive valves; and

means communicated to a vacuum input port on each of said vacuum responsive valves for varying the degree of manifold vacuum communicated thereto including:

an electric vacuum regulator (EVR) including a plurality of pressure ports and a plurality of check valves, wherein one of said check valves communicates one pressure port of said EVR valve with said vacuum input port of said first vacuum responsive valve and wherein another of said check valves communicates a second pressure port of said EVR valve with said vacuum input port of said second vacuum responsive valve,

first and second ports within the intake manifold and positioned relative to the throttle plate such that when said throttle plate is in a first condition said first port is communicated to manifold vacuum and said second port is communicated to atmospheric pressure, and when said throttle plate is moved to a second condition the communication of said first and second ports is reversed; and

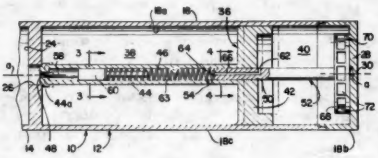
a plurality of flow restrictors, one associated with each of said first port and said second port, for communicating said first and said second port with a particular vacuum input port associated with a corresponding one of said vacuum responsive valves.

4,601,278

AMMUNITION CARTRIDGE

Hyung S. Kim, 11743 Lakewood Blvd., #37, Downey, Calif. 90241

Filed Jun. 24, 1983, Ser. No. 508,155
Int. Cl.⁴ F41B *11/08, 11/00*; F42B *5/02*
U.S. Cl. 124—57 **18 Claims**



1. A cartridge comprising:

a generally cylindrical rigid housing having at one end an annular opening in which is lodged a bullet and a first wall remote from said one end which prevents the escape of gas but may be pierced to provide a gas escape port for pressurized gas contained within the housing, and a second wall between said annular opening and the first wall having therein a gas escape opening for the pressurized gas contained within the housing;

movable sealing means, including one way valve means for feeding gas under pressure into the housing, said movable means being adapted to move between a first position where it (seals off) seals the gas escape opening and a second position displaced from the gas escape opening to allow gas to escape under pressure from the gas escape opening; and movable sealing means further comprising means in the housing which, in response to the first wall being pierced to form the gas escape port, limits the flow of gas from the escape port and moves the sealing means from the first position to the second position.

4,601,279

PYROLYTIC SELF-CLEANING DOMESTIC OVEN WITH IMPROVED MEANS FOR PROTECTING ELECTRONIC PANEL AND CONTROLS FROM HEAT DAMAGES

Jacky Guerin, Mertzwiller, France, assignor to Societe de Dietrich, Niederbronn-les-Bains, France

Continuation-in-part of Ser. No. 629,491, Jul. 10, 1984, abandoned. This application Sep. 12, 1985, Ser. No. 775,211
Int. Cl.⁴ A21B *1/00*
U.S. Cl. 126—21 A **4 Claims**

1. In a cooking/baking pyrolytic self cleaning type oven having:

an inner enclosing structure defining an oven cavity;

means for applying heat to the oven cavity for cooking/baking;

means for providing a pyrolytic-type self-cleaning operation for said oven cavity constructed and arranged to heat said oven cavity to a temperature in the neighborhood of 550° C.;

an outer frame/cabinet enclosing said oven cavity structure as a housing therefor, said frame/cabinet including openable/closable door means for permitting access to the oven cavity,

the oven cavity structure being sized, positioned and

mounted relative to the frame/cabinet so as to provide an airspace within said frame/cabinet, at least partially blanketing said oven cavity structure;

a control panel for said oven, said control panel being of a sensitive contacts one and generally frontally exposed exteriorly of the oven and including at least one control which extends internally of said frame/cabinet;

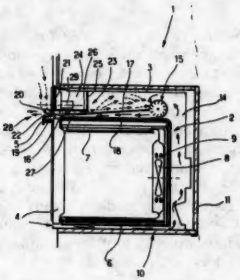
electronic control means which are subject to degradation if subjected to a temperature in excess of 60° C.;

inlet slot means in said frame/cabinet defining an inlet from exteriorly of said oven into said airspace;

outlet slot means in said frame/cabinet defining an exhaust outlet from said airspace to exteriorly of said oven, said outlet slot means being at least generally juxtaposed with said control panel;

an exhaust fan having a suction side and a pressure side; and

duct means within said airspace communicating said suction side of said exhaust fan with said outlet slot means and communicating said pressure side of said exhaust fan with said outlet slot means,



opening means through the oven cavity provided with a catalytic cartridge to evacuate hot air in the said duct means during pyrolytic phase;

the improvement wherein:

said frame/cabinet further includes an inlet means defining a cooling air inlet slot into said airspace, said cooling air inlet being juxtaposed with said control panel located all along its lower edge and intervened between said outlet slot means and said control panel, in such a manner as to substract heat from said control panel and said at least one control, said cooling air inlet being in combination with wall means as a housing defining with said control panel and frame/cabinet a substantially airtight enclosure within said airspace for said at least one electronic control mean, said wall means being made of a good conductor of heat and being arranged to form a box and to be bathed by cooling air entering through said cooling air inlet, cooling air path forming an insulating mattress between the lower plate of the housing and the said duct means, said cooling air inlet is constructed and arranged to draw cooling air frontally across said control panel and into said airspace along at least an underside and a rear face of said box.

4,601,280

FIREPLACE INSERT

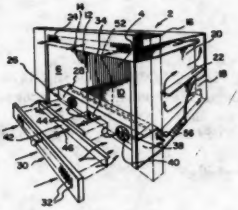
Ted Witzel, Kitchener, Canada, assignor to Onward Hardware Limited, Kitchener, Canada

Filed Jun. 11, 1984, Ser. No. 619,202

Int. Cl.[4] F24B 7/00

U.S. Cl. 126—121 **19 Claims**

1. In a prefabricated fireplace apparatus for heating a room, comprising a combustion chamber defined and enclosed by heat conducting side walls, a back wall, a floor and a top, the top having an opening to communicate with a flue to exhaust products of combustion in the chamber, the combustion chamber having a front access opening and doors mounted thereon to cover the opening so that when the doors are closed air will not be admitted to the chamber through the opening; an outer wall circumsribing the combustion chamber walls, floor and top to define therebetween an air heating chamber; the air heating chamber being provided with interior walls extending between the air heating chamber walls to define a continuous air passageway through the air heating chamber over the major portion of the area of the walls, floor and top of the combustion chamber from the floor of the combustion chamber to its top; an outlet at the top of the air heating chamber to permit passage of heated air from the air heating chamber to the room; and an inlet at the bottom of the air heating chamber to permit entry of unheated air to the air heating chamber; the improvement comprising an enclosed air manifold mounted adjacent the combustion chamber and having opposite, mutually spaced walls, a first of said walls including an inlet for



room air and a second of said walls including an inlet for outside air, the manifold being further provided with an outlet means operative to enable air from the manifold to pass into the air heating chamber at its bottom, manually adjustable air flow control means being slidable through an intermediate position between a first position wherein said control means closes the flow of air through the room air inlet while leaving open the flow of air through the outside air inlet, and a second position wherein said control means closes the flow of air through the outside air inlet while leaving open the flow of air through the room air inlet, the flow of air simultaneously through both the room air inlet and the outside air inlet being permitted when the air flow control means is in the intermediate position, said air flow control means being of a size and construction so that when air enters the manifold through either or both of the outside and room air inlets, such air will be permitted to flow through the outlet means and to the air heating chamber.

4,601,281

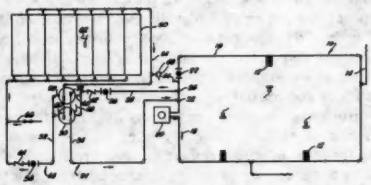
HOT WATER SUPPLY SYSTEM

James R. Piper, Villa Parke, Calif., assignor to Piper Hydro, Inc., Irvine, Calif.

Filed Aug. 3, 1981, Ser. No. 289,403

Int. Cl.[4] F24J 2/04

U.S. Cl. 126—437 **12 Claims**



1. A hot water supply system, comprising

a continuous hydraulic loop, including a loop conduit, a first pump positioned and arranged to circulate water in said

loop conduit and a boiler positioned and arranged to heat water in said loop;

a storage circuit including a storage tank, an inlet in communication with said loop, an inlet storage conduit extending from said inlet to said storage tank, an outlet in communication with said loop downstream from said inlet, an outlet storage conduit extending from said storage tank to said outlet, and a second pump positioned and arranged to circulate water through said storage circuit, said inlet and said outlet being upstream of said boiler;

a water-heating system for heating water for said storage tank independent of said circuit; and

first control means for activating said second pump only when the water in said storage tank is hotter than in said loop conduit upstream of said inlet.

4,601,282

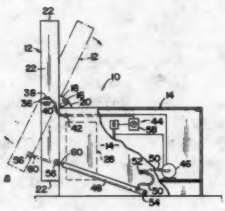
AUTOMATIC SOLAR COLLECTOR SYSTEM

John F. Mountain, Inverness, Fla., assignor to Total Solar Energy Systems, Inc., Crystal River, Fla.

Filed Jul. 12, 1984, Ser. No. 630,283

Int. Cl.[4] F24J *2/08*

U.S. Cl. 126—440 **6 Claims**



1. An automatic solar collector system for collecting solar energy in a heat transfer fluid and for storing the heated fluid for subsequent use, said collector system comprising: a solar collector panel comprising an insulated support frame having a heat exchange fluid conduit mounted therein, said conduit being operatively connected to a fluid supply at one end thereof and being operatively connected to a heated fluid storage tank at the other end thereof, said collector panel further comprising cover means defined by a plurality of lenses whereby the sun's rays may be focused along said fluid conduit; a panel box disposed in supporting relation to said collector panel whereby said collector panel is pivotally supported by said panel box, and wherein said panel box includes means for regulating fluid flow through said conduit and into the storage tank, the storage tank being insulated and mounted within said panel box; means for positioning said solar collector panel comprising an hydraulic cylinder disposed in interconnecting relation between said collector panel support frames and said panel box, said means for positioning further comprising a photo cell mounted on said collector panel support frame and operatively connected to said hydraulic cylinder through said means for regulating fluid flow to control the operation of said hydraulic cylinder to position said solar collector panel in predetermined receiving relation to the sun's rays; said means for positioning further comprising a thermostat mounted in temperture sensing relation to the heated fluid and operatively connected to said hydraulic cylinder through said means for regulating fluid flow to control the operation of said hydraulic cylinder to position said solar collector panel in a non-receiving relation to the sun's rays.

4,601,283

ENDOSCOPE WITH A MEMORY SHAPE ALLOY TO CONTROL TUBE BENDING

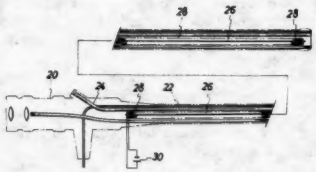
Toshio Chikama, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,377

Claims priority, application Japan, Dec. 29, 1981, 56-195770[U]

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—4 **7 Claims**



1. An endoscope having a flexible tube and a handle, an improvement comprising a shape memory alloy and a transformation temperature-imparting medium means, said shape memory alloy and transformation temperature-imparting medium means being accommodated in the flexible tube, said shape memory alloy being selectively made rigid under control of said transformation temperature-imparting medium means to restore a shape memorized by the shape memory alloy and to control the deformation of the flexible tube, said transformation temperature-imparting medium means comprising means to divide said flexible tube and said accommodated shape memory alloy into a plurality of longitudinal sections and to independently selectively actuate selected ones of said longitudinal sections.

4,601,284

ENDOSCOPE CONNECTING SYSTEM

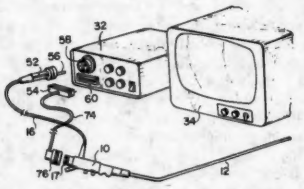
Satoshi Arakawa, Oomiya, Japan, and David H. Cooper, Saratoga, Calif., assignors to Fuji Photo Optical Co., Ltd., Japan

Filed May 6, 1985, Ser. No. 730,947

Claims priority, application Japan, May 18, 1984, 59-100287

Int. Cl.[4] A61B *1/04*

U.S. Cl. 128—6 **4 Claims**



1. An endoscope connecting system for use in displaying an image from inside a cavity onto a monitor equipment comprising:

a first endoscope comprising a first insertion section insertable into a cavity of an interested object, a control section coupled to said first connection section and an imaging system including first optical illumination means and optical imaging means for transmitting an image of said object so as to be observed through an eyepiece section mounted on said control section;

a second endoscope comprising a second insertion section insertable into a cavity of an interested object, an imaging system including second optical illumination means and a first solid state imaging device for generating a video signal which accepts a visual image information and con-

verts it into an electrical video signal, both said means being incorporated within said second insertion section;

an adaptor detachably mounted on said eyepiece section of said first endoscope, said adaptor including therein a second solid state imaging device which accepts information of said transmitted visual image and converts it into a video signals;

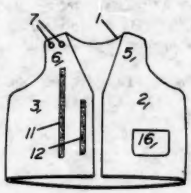
a control unit connectable to said second endoscope and said adaptor, said control unit further comprising an illumination light source for providing light in a red, green and blue sequence and a video signal processor for processing said video signal from said first or second video signal and providing a composite video signal for presenting an image of the object on a monitor equipment.

4,601,285

ARM SLING DEVICE

Patricia A. Whitchurch, 3908 Hickory Hill Dr., Somerset, Ky. 42501

Filed Jun. 6, 1983, Ser. No. 501,364
Int. Cl.⁴ A61F *5/40*
U.S. Cl. 128—94 **4 Claims**



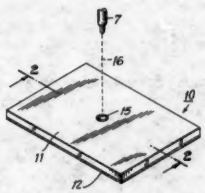
1. A sling device for supporting a person's arm including a vest having a back, and at least one front lapel; first fastener means provided adjacent the shoulder on one side of the lapel; second fastener means on the opposite side of the lapel; a strap device having first cooperative securing arrangement adjacent the first end of the strap and a second securing device adjacent the second end of the strap so that said strap can be secured by the first securing arrangement to the first fastening device and the second end of the strap can be secured to the second fastening device by means of the second securing device to form a sling to receive an arm of the person wearing the vest.

4,601,286

ARTICLE FOR THE PROTECTION OF LIVING TISSUES

Jack W. Kaufman, 367 Frankel Blvd., Merrick, N.Y. 11556

Filed Apr. 20, 1984, Ser. No. 602,602
Int. Cl.⁴ A61B *19/08*
U.S. Cl. 128—132 D **11 Claims**



1. A surgical drape for the protection of healthy tissue from damage due to undesired exposure to lasers during surgery comprising a sheet having a hole therethrough, said hole having about the same dimensions as the site of tissue exposure to permit unimpeded passage of the beam therethrough and access to only the site to be lased said drape comprising a hydrogel comprising

A. at least one hydrophilic water-insoluble polymer and

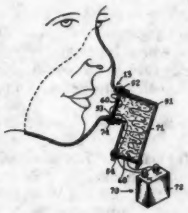
B. water.

4,601,287

HEATED SURVIVAL FACE MASK

George H. Royce, Jr., Box 280, 114 S. Main, Wilburton, Okla. 74578

Continuation-in-part of Ser. No. 250,969, Apr. 1, 1981, abandoned, and a continuation-in-part of Ser. No. 502,428, Jun. 8, 1983, abandoned. This application Oct. 8, 1985, Ser. No. 785,631
Int. Cl.⁴ A62B *7/00*
U.S. Cl. 128—204.17 **8 Claims**



1. An improved heated face mask for use in outdoor activities in cold weather comprising:

a mask portion fabricated from air impervious material and adapted to cover a user's nose, mouth and cheek areas in a snug fitting relationship, wherein the mask portion is provided with an enlarged central aperture, formed by a short tubular extension formed in the mask portion;

an elongated generally L-shaped breathing tube, having one end rotably received in the said short tubular extension formed in the mask portion, and having apertured inboard and outboard breathing disks disposed adjacent the inboard and outboard ends of the breathing tube, wherein said apertured breathing disks are further provided with a plurality of apertures, and with shallow recesses in at least one of their faces;

a heating member comprising an external power source, and a heating wire element, wherein the heating wire element occupies the space in the breathing tube defined by the said breathing disks, and is dimensioned to be threadedly engaged through said apertures in said breathing disks, and frictionally engaged by the shallow recesses on the faces of the breathing disks; and,

securing means attached to said mask portion and adapted to maintain the periphery of the mask portion in intimate contact with the user's face, so that all respiration will transpire through said breathing tube, and the inhaled ambient atmosphere will be heated as it passes around the heating element, wherein the heating wire element is threadedly passed through said apertures, in at least said outboard breathing disk.

4,601,288

LASER DEVICE AND METHOD

John D. Myers, 900 Sandalwood East, Perrysburg, Ohio 43551

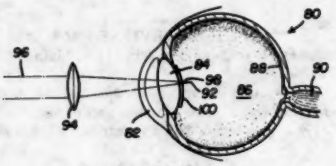
Division of Ser. No. 583,504, Feb. 24, 1984, Pat. No. 4,525,842. This application Feb. 21, 1985, Ser. No. 703,963
Int. Cl.⁴ A61B *17/36*
U.S. Cl. 128—303.1 **3 Claims**

1. A method of treatment of opacity of the lens of an eye resulting from foreign matter at the back surface of the eye lens within the vitreous fluid body of the eye with a passively Q-switched laser device, the method comprising:

(a) generating a single lasing pulse emitted from said laser

device focused within said eye vitreous fluid body, spaced from said lens back surface, creating a microplasma dot in said vitreous fluid body

(b) then increasing the frequency of the lasing pulses emitted



from said lasing device having a frequency greater than the life of said microplasma to generate an elongated lasing plasma within said eye vitreous fluid moving toward said lens back surface, until said elongated lasing plasma contacts and destroys said foreign matter.

4,601,289

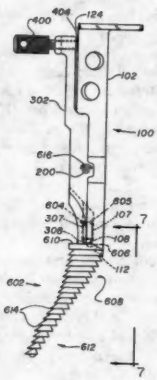
FEMORAL TRIAL PROSTHESIS/RASP ASSEMBLY

Samuel J. Chiarizzio, and Kenneth W. Russell, both of Memphis, Tenn., assignors to Dow Corning Wright, Arlington, Tenn.

Filed Apr. 2, 1985, Ser. No. 719,785

Int. Cl.[4] A61F *17/32, 5/04, 2/36*

U.S. Cl. 128—305 **6 Claims**



1. In combination, a femoral trial prosthesis/rasp assembly for use in the implantation of a proximal femoral prosthesis, said assembly comprising:

a trial prosthesis/rasp comprising a first elongated member having a tapered and slightly curved configuration extending from a relatively wide upper end towards a narrower lower end, said member having a cutting portion extending from said upper end downward over at least a portion of its surface and having cutting teeth projecting from the surface of said cutting portion, said first member further having a post affixed to said upper end, and

a handle assembly adapted to releasably engage said post and said upper end of the first member in a predetermined orientation with respect to said handle assembly, said handle assembly comprising:

a second elongated member having a lower end which contains a recess adapted to receive a portion of said post in close-fitting and locking engagement, said post having a configuration which permits said locking engagement, said second member having an upper end which is adapted to be manually engaged and to be struck by a hammer to facilitate use of the trial prosthesis/rasp to form a prosthesis socket in the femur,

a lever having a lower end which contains a recess adapted to receive a portion of the post which is opposite that which is engaged by the recess in the second elongated member, a second opposing end, and

a pivot pin means interconnecting said lever and said second member at a point between the ends thereof whereby the post is received and rigidly engaged within said recesses when the lower end of said lever is biased in the direction of the lower end of the second member by

a screw means which cooperatively engages and passes through the upper end of said lever and is adapted to bias said upper end of the lever away from the upper end of the second member and cause the opposing lower ends of the lever and second member to close and engage said post when the screw means is turned in one direction and to permit said lower ends to open and release said post when the screw means is turned in the opposite direction.

4,601,290

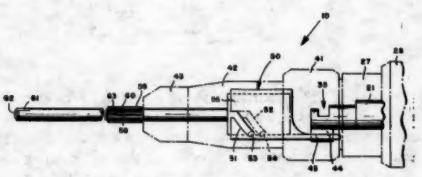
SURGICAL INSTRUMENT FOR CUTTING BODY TISSUE FROM A BODY AREA HAVING A RESTRICTED SPACE

Marc H. Effron, New Hope, and Henry J. Tancredi, Gwynedd, both of Pa., assignors to Cabot Medical Corporation, Langhorne, Pa.

Filed Oct. 11, 1983, Ser. No. 540,319

Int. Cl.[4] A61F *17/32*

U.S. Cl. 128—305 **13 Claims**



1. In a surgical instrument for cutting and removing body tissue from a body joint having a restricted space, a cutter comprising a body member and:

(a) an elongated external tube carried by the body member and sized for insertion into the restricted space and having an external opening therein extending longitudinally of said tube and having a cutting edge thereon;

(b) an internal tube also carried by the body member and positioned within the external tube and having an internal opening therein extending longitudinally of said internal tube and having a cutting edge thereon;

(c) the external and internal openings and cutting edges each being relatively movable with respect to the body member and movable concurrently in opposite directions with respect to the longitudinal axes of the tubes to open to receive the body tissue therethrough and to close to cut the body tissue;

(d) vacuum means operative to draw a vacuum within the internal tube, for drawing the body tissue in through the external and internal openings;

(e) cutter drive means operative to oscillatingly drive the internal tube and the external tube relative to said body member and in opposite rotational directions causing the internal and external cutting edges to cut the body tissue, whereby the vacuum means draws the cut body tissue away from the internal and external openings; and

(f) cutter drive control means for independently varying (i) the frequency of the oscillating internal and external cutting edges, and (ii) the dwell time of the internal and external cutting edges when said cutting edges are in the

open position while maintaining essentially constant the cutting force exerted by the cutting edges.

4,601,291

BIOMEDICAL SYSTEM WITH IMPROVED MARKER CHANNEL MEANS AND METHOD

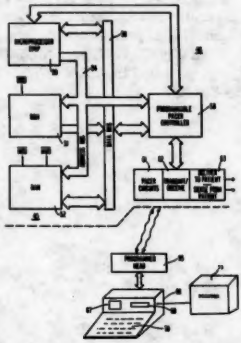
Willem Boute, Doesburg; Guus Stoop; Gerrit W. van Arragon, both of Dieren, and Kornelis A. Mensink, Brummen, all of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands Antilles

Filed Apr. 5, 1984, Ser. No. 596,916

Claims priority, application European Pat. Off., Feb. 10, 1984, 84101388

Int. Cl.⁴ A61N *1/36*

U.S. Cl. 128—419 PT **23 Claims**



1. A pacemaker system comprising an implantable dual chamber pacemaker having means for sensing atrial and ventricular events and means for timing atrial and ventricular pacemaker operation, and external apparatus for storing data and displaying data, characterized by

said pacemaker having output means for cyclically outputting event and pacemaker timing data representative of a prior pacemaker interval;

said external apparatus having means for receiving and storing said outputted data in storage; and

graphic constructing means for constructing from said stored data a dual channel graphic output representative of both atrial and ventricular pacemaker timing and events for a plurality of pacemaker cycles, said graphic constructing means further comprising linear print means for printing linear symbols respectively representative of different sensing conditions, said linear symbols having lengths representative of the time durations of said sensing conditions.

4,601,292

STEERABLE DOPPLER TRANSDUCER PROBES

Howard F. Fidel, Hartsdale, and David L. Greenwood, New York, both of N.Y., assignors to Johnson & Johnson Ultrasound, Inc., Ramsey, N.J.

Filed Nov. 8, 1984, Ser. No. 669,703

Int. Cl.⁴ A61B *10/00*

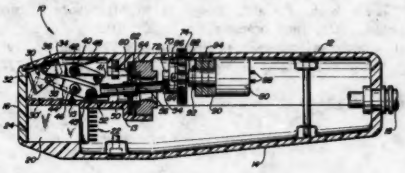
U.S. Cl. 128—660 **13 Claims**

1. An ultrasonic diagnostic probe which is capable of performing ultrasonic imaging and Doppler measurement, comprising:

a hollow case having an acoustic window which passes ultrasonic energy and including chamber means for containing fluid located within said hollow case and adjacent to a portion of said acoustic window;

imaging transducer means, located in said hollow case and outside said fluid chamber means, and oriented to direct ultrasonic energy through said acoustic window toward an area which is to be imaged;

Doppler transducer means, located in said hollow case within said fluid chamber means, and movably oriented to direct Doppler signals through said acoustic window toward said imaged area;



means located within said fluid chamber means and externally controlled for controllably moving said Doppler transducer means to select one of a plurality of axes in said imaged area along which said Doppler signals are to be directed; and

means, located external to said fluid chamber means and responsive to said means for moving, for providing an indication signal for identifying said selected axis.

4,601,293

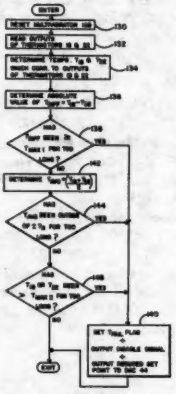
TEMPERATURE CONTROL SYSTEM FOR CUTANEOUS GAS MONITOR

Stuart L. Foster, Fountain Valley, and Gerald T. Stillman, Fullerton, both of Calif., assignors to Sensormedics Corporation, Anaheim, Calif.

Filed Jul. 5, 1983, Ser. No. 510,787

Int. Cl.⁴ A61B *5/00*

U.S. Cl. 128—635 **16 Claims**



1. A temperature control system for a cutaneous gas sensor of the type having a temperature sensing element for producing an output signal indicative of the actual temperature of the sensor, and a heating element, comprising:

(a) a temperature setting means generating a setpoint signal, the setpoint signal being variable between, at least, a first and a second temperature, the first temperature being substantially the temperature of the sensor when measurements of a body are made, and the second temperature being substantially the temperature of the sensor when the sensor accelerates the heating of at least part of the body before the measurements of the body are made, and

(b) a closed loop temperature control circuit, connected to

the temperature setting means and responsive to the set-point signal and responsive to the output signal, for varying the flow of current through the heating element.

4,601,294

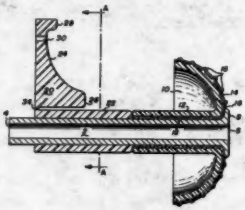
EAR CANAL ELECTRODE

Hal C. Danby, Palo Alto, and Myron A. Beigler, Los Altos Hills, both of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 342,490, Jan. 25, 1982, abandoned. This application Sep. 27, 1982, Ser. No. 424,425

Int. Cl.[4] A61B *5/12, 5/04*

U.S. Cl. 128—642 **24 Claims**



1. A non-invasive, external ear canal electrode comprising a conductive tube means for transmitting a sound stimulus to an ear canal and the tube means having a distal end, a resilient annular sensor means mounted on the distal end thereof for pressing outward against the inner surface of the ear canal and sensing electrical signals thereon, the annular sensor means having a resilient flared disk portion which extends radially outward beyond other elements at the distal end for contacting the ear canal surface, the flared disk portion having an outer conductive coating thereof and a tubular portion concentrically mounted on and engaging the conductive tube means, the conductive coating being in electrical contact with the conductive tube means.

4,601,295

EAR PATHOLOGY DIAGNOSIS APPARATUS AND METHOD

John H. Teele, 22 Ruthellen Rd., Chelmsford, Mass. 01824

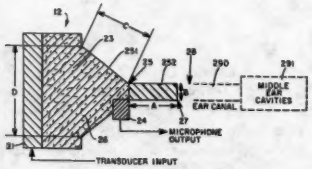
PCT No. PCT/US83/00380, § 371 Date Nov. 15, 1983, § 102(e) Date Nov. 15, 1983, PCT Pub. No. WO83/03192, PCT Pub. Date Sep. 29, 1983

Continuation-in-part of Ser. No. 358,831, Mar. 16, 1982, Pat. No. 4,459,966. This PCT application Mar. 16, 1983, Ser. No. 557,123

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

Int. Cl.[4] A61B *5/12*

U.S. Cl. 128—746 **7 Claims**



1. Apparatus for detecting pathologic ear conditions, comprising

A. an acoustic signal generator providing an acoustic output that sweeps over a frequency range of at least several kilohertz during a measurement,

B. an acoustic waveguide having an input end coupled to receive the output of said generator and an output end positionable adjacent to and exteriorly of the outer canal of an ear being examined and transmitting acoustic waves into the outer canal of said ear, said output end characterized by an acoustic output impedance that is less than the acoustic input impedance of a typical canal to be examined;

C. a microphone positioned to receive inputs from both the generator and from reflections from said ear, and providing an output indicative of the sum of said inputs,

D. means for displaying at least a portion of the output of said microphone for detecting departure of said output from the expected output for a normal ear.

4,601,296

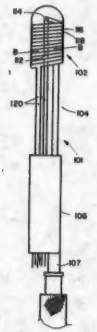
HYPERTHERMIA APPARATUS

Aharon Yerushalmi, Rehovot, Israel, assignor to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Oct. 7, 1983, Ser. No. 540,016

Int. Cl.[4] A61N *5/02*

U.S. Cl. 128—804 **8 Claims**



1. Apparatus for hyperthermic treatment of tumours in the vicinity of the anal body cavity whereby the cavity mucosa and the cavity walls are cooled while simultaneously heating said tumours, said apparatus comprising:

probe means arranged to be insertable into a body cavity and including:

a housing having forward and rearward surfaces;

radiation-producing antenna means rigidly disposed in said housing; and

cooling conduit means disposed peripherally of said housing and arranged to receive cooling fluid for cooling body tissue disposed in propinquity thereto, said cooling conduit means comprising flexible conduit coiled about the outside forward peripheral suface of said housing, whereby it may be compressed upon insertion into the anal cavity and expanded forwardly of the sphincter muscle when coolant passes therethrough for secure engagement in said cavity, thus retained by the sphincter muscle.

4,601,297

CIGARETTE MANUFACTURING MACHINE WITH AN AUXILIARY TOBACCO FEED UNIT

Riccardo Mattei, and Bruno Belvederi, both of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Oct. 15, 1984, Ser. No. 660,959

Claims priority, application Italy, Oct. 28, 1983, 3599 A/83

Int. Cl.[4] A24C *5/39*

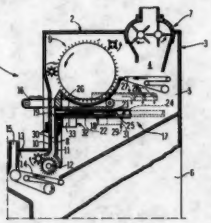
U.S. Cl. 131—109.1 **11 Claims**

1. A cigarette manufacturing machine comprising:

a main tobacco supply unit:

a shredded tobacco supply duct extending downwardly from said main tobacco supply unit;

an auxiliary tobacco supply unit having an outlet communicating with an intermediate point of said duct, said auxiliary unit comprising an input conveyor and a tray, said tray being arranged between an outlet of said input conveyor and said duct, and having a bottom wall which extends in a substantially horizontal plane, and is substantially constant in width;



a vibratory unit being coupled to said tray to impart thereto a vibration the amplitude of which may be varied from point to point across said bottom wall;

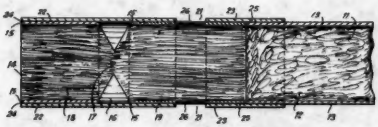
and level detecting means sensitive to the level of the tobacco within said duct, said level detecting means controlling the amplitude of the vibration imparted by said vibratory unit to any point of said bottom wall so as to even out any difference in level detected by said detecting means over the width of said duct.

4,601,298

FILTER CIGARETTE

Walter A. Nichols, and Reginald W. Newsome, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,052
Int. Cl.[4] A24B *3/04*
U.S. Cl. 131—336 **10 Claims**



1. A filter cigarette comprising a tobacco rod, a substantially cylindrical filter plug, a plug wrapping circumscribing said filter plug, and tipping paper overlying said plug wrapping and circumscribing and joining said filter plug and a portion of said tobacco rod, said filter plug comprising a mouth-end segment of filter tow material axially connected to a rod-end segment of filter tow material for relative rotation about the axis of the cigarette such that said rotation causes said mouth-end segment to move axially between a first position axially spaced from said rod-end segment and a second position in compressive contact with said rod-end segment, said tipping paper comprising, in axial sequence, first and second bands, said first band extending from a first point on said rod-end segment to a point on said tobacco rod and fixedly connecting said tobacco rod to said rod-end segment, and said second band being fixed to said mouth-end segment and extending axially to a second point on said rod-end segment, said second point being closer to said mouth-end segment than said first point, said second band being spaced axially from said first band when said mouth-end segment is in said first position and axially abutting said first band when said mouth-end segment is in said second position, said plug wrapping being air permeable in at least a region between said first and second points, said axial movement of said mouth-end segment carrying said second band toward and away from said first band, thereby exposing varying amounts of said air permeable region of said plug wrapping, thereby varying the air dilution value of said filter cigarette.

4,601,299

HAIR SETTING PROCESS AND TISSUE

Leszek J. Wolfram, Stamford, and Linda Albrecht, W. Redding, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,681
Int. Cl.[4] A45D *7/00*
U.S. Cl. 132—7 **21 Claims**

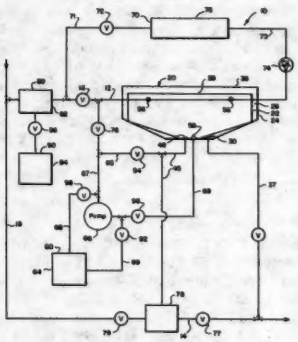
1. A process for imparting a wave to hair, which comprises applying a premoistened webbing to the end of a section of dry hair, winding the section of hair around a preheated roller, and then removing the hair from the roller and the webbing from the hair.

4,601,300

APPARATUS FOR LIQUID DISINFECTING AND STERILE RINSING

Craig S. Sundheimer, Salt Lake City, Utah, assignor to American Sterilizer Company, Erie, Pa.

Filed Dec. 20, 1984, Ser. No. 683,814
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—95 **12 Claims**



1. Apparatus for use with a conventional fluid supply for providing disinfected articles comprising:

an outer vessel having a lid;

an inner vessel adapted to receive the articles, said inner vessel being so disposed within said outer vessel that an outer chamber is defined therebetween;

means for introducing fluid into said inner vessel;

means for so covering said inner vessel that an interface is defined between said inner vessel and said covering means, said interface being adapted to permit fluid which fills said inner vessel to overflow therethrough into said outer chamber;

said outer chamber being so associated with said inner vessel that at least said interface and said covering means are submerged by the fluid flowing into said outer chamber; and

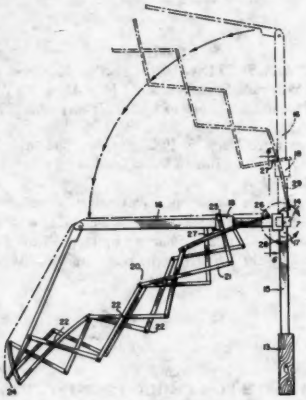
means for selectively draining said inner vessel and said outer chamber.

4,601,301

UMBRELLA WITH LAZY TONG STRUCTURE

Terry Hermanson, c/o 41 Madison Ave., New York, N.Y. 10010

Filed Jun. 19, 1985, Ser. No. 746,529
Int. Cl.[4] A45B *19/00*; E04H *15/50*
U.S. Cl. 135—25 R 9 Claims



1. An umbrella comprising

a lazy tong structure having struts interconnected at intermediate and end points on said struts forming said lazy tong structure as a substantially peripheral support;

off-set handle means connected to said lazy tong structure and including a handle at its lower end;

a support arm pivotally connected to said handle means at the upper end of said means, and with an opposite free end of said support arm connected to and supported by said lazy tong structure and with said opposite end limited in its movement by said lazy tong structure;

and a canopy attached to said lazy tong structure and draped over the end of said handle means pivotally connected to said support arm.

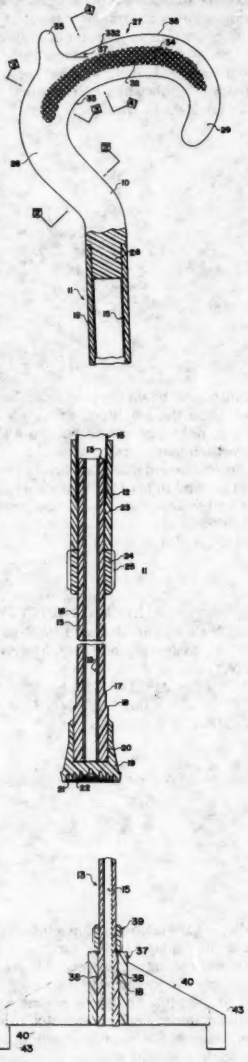
4,601,302

CANE HAVING HANDLE WITH STOP MEMBER

Jonathon Breen, Box 53, Fort Whyte, Manitoba, Canada (R0G 0R0), and Drew Petursson, 960 Lemay St., Winnipeg, Manitoba, Canada (R3V 1E8)

Filed Feb. 15, 1984, Ser. No. 580,370
Int. Cl.[4] A45B *9/02*; A61H *3/00*; F16M *13/08*
U.S. Cl. 135—66 13 Claims

1. A walking cane including a stick portion and a handle, the handle comprising a hand grip portion which has a forward end and a rear end and is of elongate generally cylindrical shape free from encumberances from said forward end to said rear end whereby it can be wrapped around by the hand of the user between said forward and rear ends with the fingers wrapped in one direction and the thumb in the opposed direction and which lies generally at right angles to the length of the stick portion, means interconnecting said forward end to one end of said stick portion, the handle being shaped such that, with the stick portion vertical, a portion of an upper surface of the hand grip portion is inclined downwardly toward said forward end and a portion inclined downwardly toward said rear end and such that an extrapolation of the stick portion intersects the hand grip portion intermediate its length, and a stop member projecting upwardly from the forward end of the hand grip portion to form a junction between said stop member and said hand grip portion, the upper surface of the hand grip portion adjacent the stop member being flattened from a circular cylindrical shape, a width dimension of the stop member at the junction being the same as that of the hand grip portion and



the junction being smoothly curved to receive and locate a portion of the hand of the user.

4,601,303

ELECTRO-OPTICAL FUEL BLENDING PROCESS

Jay E. Jensen, Raritan, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 685,002
Int. Cl.[4] C10L *1/00*
U.S. Cl. 137—3 36 Claims

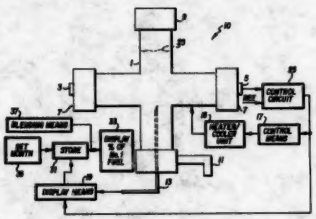
1. A process for blending a fuel which includes a first fuel component and a second fuel component, said first fuel component being used to produce a fuel mixture which will not form

solid particles above a predetermined temperature, said process comprising the steps of:

(a) varying a temperature of a sample of said second fuel component;

(b) transmitting radiant energy from an energy source through said second fuel component sample;

(c) detecting a predetermined intensity level of radiant energy transmitted by said source after said radiant energy has passed through said second fuel component sample;



(d) obtaining a temperature measurement indicating a temperature of said second fuel component sample when said predetermined intensity level is detected;

(e) determining a percentage amount of said first fuel component to be mixed with said second fuel component based on said temperature detected in step (d) to obtain a fuel mixture which will not form solid particles above a predetermined temperature; and

(f) blending said first and second fuel components in accordance with said percentage amount determined in step (e).

4,601,304

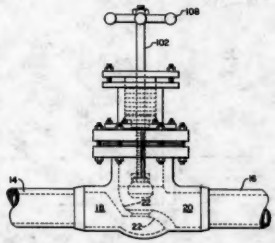
VALVE ASSEMBLY

Howard T. Schobl, P.O. Box 20, Imperial, Pa. 15126

Filed Aug. 9, 1984, Ser. No. 639,229

Int. Cl.[4] F16K *43/00, 41/02*

U.S. Cl. 137—315 **7 Claims**



1. In a valve having a body for the passage of fluid;

a threaded valve stem; and

a bonnet connected to said body and having a threaded opening to receive said valve stem;

the improvement comprising a separate packing housing assembly means sealingly connected to said bonnet and being removable from said bonnet and including:

a packing material chamber within said packing housing assembly means through which a portion of said valve stem extends;

an annular drive bushing in said packing material chamber adjacent to said bonnet and surrounding said valve stem;

a packing gland in said packing material chamber remote from said bushing and surrounding said valve stem;

packing material comprising a plurality of packing material elements in said packing material chamber compressively engaged between said drive bushing and said packing gland, each of said packing material elements having a central opening through which said valve stem extends;

means for urging said packing gland into said packing material chamber;

whereby

(a) said packing means assembly may be removed from said bonnet while said valve stem remains operative in threaded engagement with said bonnet; and

(b) whereby said annular drive bushing and said packing material can be pushed through said packing material chamber for replacement upon complete removal of said packing housing assembly means from said bonnet.

4,601,305

COMPACT GAS COMPRESSOR CHECK VALVE

Robert A. Nordskog, 18135 Karen Dr., Tarzana, Calif. 91356

Filed Nov. 29, 1984, Ser. No. 676,258

Int. Cl.[4] F16K *15/04*

U.S. Cl. 137—528 **1 Claim**

1. An improved compact gas compressor check valve, said valve comprising, in combination:

(a) a valve body having internal surfaces defining a gas passageway extending longitudinally therethrough from end to end, said passageway having two portions of different diameters separated by a valve element seat,

(b) a ball valve element having a given constant radius of curvature slideably disposed in the larger diameter portion of said passageway and adapted to block said narrower diameter portion of said passageway when contacting said seat and permitting free flow of gas through said valve when away from said seat;

(c) said valve element seat being curved and having a radius of curvature identical to the radius of curvature of said ball valve element whereby said element and seat form a positive seal of substantial surface area when in contact with one another,

(d) retaining means securing said valve element against removal from said larger diameter portion of said passageway;

(e) means defining with said valve element and said internal surfaces spaced gas flow channels extending longitudinally through said larger diameter portion of said passageway for improved gas flow therethrough; and,

(f) valve element guide means facilitating centering of said valve element in said passageway and passing therethrough,

(g) wherein said valve body is generally cylindrical and said valve seat is annular and integral with said valve body,

(h) wherein said means defining gas flow channels comprises a plurality of spaced protrusions directed inwardly from said larger diameter portion of said passageway and adapted to contact the outer surface of said ball, said protrusions extending longitudinally of said passageway,

(i) wherein said protrusions act as said valve element guide means and wherein the distance between opposed protrusions is approximately the diameter of the valve element,

(j) wherein said protrusions are integral with said internal surfaces defining said larger portion of said passageway,

(k) wherein said valve is an aircraft galley air conditioning compressor check valve, wherein said seat is sloped and wherein said retaining means comprises a transverse pin inserted through the side of said valve body and bridging at least a portion of said large diameter portion of said passageway adjacent the outer end thereof,

(l) wherein the cross-sectional configuration of said large

diameter of said passageway presents a sinusoidal wave form extending about the inside of said passageway,

(m) wherein the most inwardly directed portion of said protrusions are rounded and present a single point contact with the outside surface of said valve element.

4,601,306

APPARATUS FOR ASCERTAINING AND/OR KEEPING CONSTANT THE MIXING RATIO OF A LIQUID MIXTURE

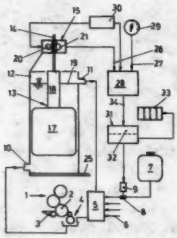
Ernst Engelhardt, Augsburg, and Georg Kölbl, Neusäss, both of Fed. Rep. of Germany, assignors to Balwin - Gegenheimer GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,958

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411163

Int. Cl.[4] G05D *11/13*

U.S. Cl. 137—91 **11 Claims**



1. An apparatus for regulating the ratio of mixing of a component with a liquid comprising a vessel for containing a sample of said liquid, a float in said vessel, said vessel having an inlet and an overflow, a controller designed for cooperation with said float, a vertically extending marker on said float and arranged to be moved thereby in accordance with a relative level of said float in said liquid, said marker having indicating zones with indicia thereon, said zones being placed one above the other and vertically aligned on said marker in the length direction thereof, said zones having different respective vertical heights corresponding to units of concentration of said component in said liquid in accordance with a non-linear relationship between amounts of said component added to said liquid and resulting changes in the specific gravity thereof, a sensing device adapted to be responsive to said zones at different levels of said float relative to said liquid, said sensing device being designed to produce control signals representative of said zones in accordance with said level of said float in said liquid sample, said controller having a control signal input connection for such control signals, a set point input connection and at least one servo signal output for controlling the composition of said liquid.

4,601,307

LUBRICATED PLUG VALVE

Bruce R. Johnson, Sebastopol, Calif., assignor to Jandy Industries, Novato, Calif.

Filed Jul. 8, 1985, Ser. No. 752,633

Int. Cl.[4] F16K *5/22*

U.S. Cl. 137—246.22 **2 Claims**

1. A rotary plug valve comprising:

a valve body annular in cross-section;

at least two hubs extending radially from said body and having flow passageways therethrough opening into said valve body;

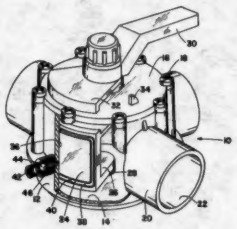
a smooth circular inner surface around said body forming an internal sealing surface around and intermediate said flow passageways;

a valve closure member rotatable in said body and having an arcuate outer surface complementary with said sealing surface and fitting closely therein;

a seal ring recess formed in said arcuate surface;

a resilient seal ring in said recess;

said seal ring being large enough to engage fully said sealing surface completely around either of said flow passageways but small enough to engage fully said sealing surfaces and enclose an area thereof at a grease application position between two of said flow passageways; and



a grease port through the annular wall of said body positioned so that when said closure member is in said grease application position a confined quantity of grease is introduced between said sealing surface and said arcuate outer surface in said enclosed area defined by said seal ring whereby said enclosed area on said valve closure distributes the grease over said sealing surface between said grease application position and a valve close position.

4,601,308

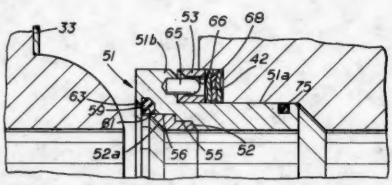
BALL VALVE WITH SEAT LOADING MECHANISM

Ralph S. Stone, Missouri City, and William S. Shelton, Houston, both of Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Dec. 30, 1985, Ser. No. 814,360

Int. Cl.[4] F16H *43/00*

U.S. Cl. 137—315 **5 Claims**



1. A ball valve comprising a valve body having a valve chamber and inlet and outlet flow passages communicating therewith, a ball valve element mounted within said valve chamber for rotational movement between first and second positions to open and close the valve, a pair of seat pockets formed in the valve body at the ends of the passages which opens to the valve chamber, each seat pocket including a reduced diameter section and an enlarged diameter section forming a radial shoulder in the seat pocket at its juncture with the reduced diameter section, a pair of valve seat assemblies positioned in said seat pockets at opposed sides of the ball valve element, each said valve seat assembly comprising an outer seat ring having an annular sealing element mounted in the end of the ring facing the ball element and adapted to establish a seal therewith which seals the flow passage from the valve chamber, said outer seat ring including a reduced diameter portion received in the reduced diameter section of the seat pocket but of a diameter corresponding substantially there-

with, and an enlarged diameter portion received in the enlarged section of the seat pocket and defining an annular radial shoulder on the seat ring; at least three projecting pins mounted on said seat ring to extend from said annular radial shoulder of the seat ring in a direction generally coaxial with the ring axis, said pins being substantially equal in length and spaced about the ring in generally equiangular spacing;

a spacer ring mounted on the reduced diameter portion of the seat ring in sleeved relationship therewith, said spacer ring having at least three recesses formed therein in a configuration and spacing conforming to that of said pins whereby the pins are adapted to be received in said recesses, said spacer ring being rotably movable and slidable on said seat ring between a first position wherein the spacer ring engages the tips of the pins and is spaced from the annular shoulder of the seat ring and a second position wherein the pins are received in the recesses and the spacer ring is in juxtaposed engagement with the seat ring; and

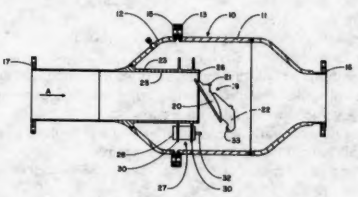
a spring means mounted in the seat pocket between the spacer ring and the radial shoulder of the seat pocket to continuously urge the spacer ring towards said seat shoulder and thereby urge the seat assembly into loaded sealing engagement with the ball valve element when the spacer ring is in its first operational position, said seat assembly being retracted from the ball valve element when the spacer ring is in its second operational position.

4,601,309

VALVE AND DASH-POT ASSEMBLY

Shih-Chih Chang, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 23, 1985, Ser. No. 726,565
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—514 **5 Claims**



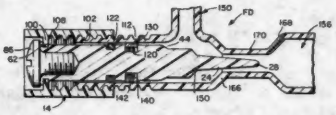
1. A valve and dash-pot assembly comprising: a housing having a valve seat, a valve member pivotally mounted in said housing between a valve open position and a valve closed position engagable against said seat, a dash-pot valve submerged in the fluid within said housing and including a cylinder formed with an end wall having an outlet, and having a reciprocal piston, a plunger attached to said piston and projecting outwardly of said cylinder in the path of closing movement of said valve member, a chamber in said cylinder, means for normally biasing said piston and attached plunger outwardly into an extended position, a fixed plate mounted within said cylinder between said piston and said end wall and provided with fluid passage means which directs fluid tangentailly into said chamber for developing a vortex flow in said chamber upon retraction of said piston to effect increasing resistance against said piston and plunger to progressively retard closing movement of said valve member toward said valve seat, said vortex flow with said resistance not being produced upon outward movement of said piston.

4,601,310

QUICK TURN METERING VALVE

Edwin Phillips, 700 Cedar Ave., P.O. Box 67, Middlesex, N.J. 08846

Filed Dec. 23, 1982, Ser. No. 452,721
Int. Cl.[4] F16K *37/00, 1/54;* F16J *9/00*
U.S. Cl. 137—556 **36 Claims**



1. A valve device comprising:

a one-piece valve body having a fore end, an aft end and a trunk connecting said ends together;

a heel section on said one-piece valve body aft end, said heel section including a thin tubular wall and a shoulder at the intersection of said wall and said one-piece valve body;

a body bore defined longitudinally of said body through said heel section and into said trunk;

a cap having a cap bore defined longitudinally therein, an annular shoulder mounted on said cap to project inwardly of said cap bore, and fastening means on said cap for releasably attaching said cap to a flow device; and

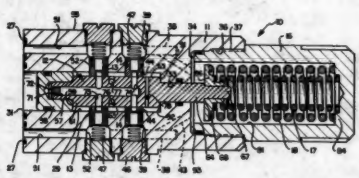
flaring means for flaring said heel section thin wall of said one-piece valve body over said cap annular shoulder to capture said annular shoulder between said flared thin wall and said heel section shoulder for attaching said cap to said one-piece valve body in a manner which permits rotation of said cap relative to said valve body so that the valve body can be opened and closed without rotating.

4,601,311

SUB-SEA PILOT-OPERATED VALVE

Richard C. Acker, Chagrin Falls, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 28, 1984, Ser. No. 687,518
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—625.66 **6 Claims**



1. A directional control valve comprising a housing body having an interior cavity, a valve slide slidably disposed on an axis in the housing cavity, the slide having a pair of opposite generally parallel faces, internal flow passage means in the slide, a port on each slide face in common communication with the internal passage means, said ports having the same axial location on the slide, a pair of sleeve seals carried on the body, each sleeve seal being arranged to cooperate with one of said ports, the wall thickness of each sleeve seal being at least as great as the width of its respective port whereby said sleeve seals provide non-interflow action, a separate passage associated with each sleeve seal for conducting fluid between its associated sleeve seal and an external port on the body, the internal flow passage of the slide extending generally longitudinally within the slide to a zone remote from said slide ports and ported at said zone to the exterior of said slide such that the internal flow passage is arranged to conduct a total flow through both of said sleeve seals whereby a relatively large

flow rate is achieved with a relatively small overall physical valve size, said housing including a chamber, said slide having an end face exposed to pressure in said chamber, passage means for connecting said sleeve seals and said chamber through said external port to a common source of fluid pressure external to said housing body, the non-interflow action of the sleeve seals conserving hydraulic energy provided by said source.

4,601,312

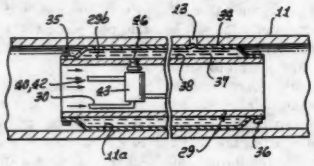
REPAIR OF HOLES AND CRACKS IN CLAY SEWER PIPE

William A. Parkyn, Sr., 1810 Diana Ave., Anaheim, Calif. 92805, assignor to William A. Parkyn, Sr. and Kathleen C. Parkyn, both of Anaheim, Calif.

Division of Ser. No. 600,893, Apr. 16, 1984. This application Sep. 30, 1985, Ser. No. 782,081

Int. Cl.⁴ F16L *55/18*

U.S. Cl. 138—97 **12 Claims**



1. The method of repairing a sewer line having a fracture, and employing a liner sleeve and an elastomer sleeve extending about the liner sleeve, and a flowable hardenable filler, that includes:

(a) installing the liner sleeve and said elastomer sleeve endwise in the sewer line to locate the two sleeves in bridging relation with the fracture, and

(b) displacing said flowable filler between the two sleeves to cause the elastomeric sleeve to expand and seal against the sewer line in close bridging relation with the fracture, and

(c) allowing the filler to harden, between said sleeves.

4,601,313

DEVICE FOR FIXING AN AUXILIARY MEMBER OR ACCESSORY UPON THE REED OF A SHUTTLELESS LOOM OR WEAVING MACHINE

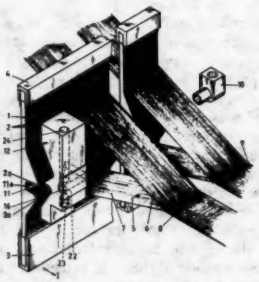
Hubertus H. Aarts, Deurne, Netherlands, assignor to Rüti-te Strake B.V., Deurne, Netherlands

Filed Jun. 18, 1984, Ser. No. 622,017

Claims priority, application Netherlands, Jul. 11, 1983, 8302456

Int. Cl.⁴ D03D *41/00*

U.S. Cl. 139—194 **8 Claims**



1. A device for adjustably fixing an auxiliary member in the weft direction upon the reed of a shuttleless weaving machine, said reed having a rear side and comprising a plurality of reed lamellae defining dents of the reed, wherein:

said auxiliary member is provided with at least one flange;

said at least one flange including a flange portion protruding between an adjacent pair of said reed lamellae through the reed to said rear side thereof;

the providing flange portion being provided with an aperture on said rear side of the reed; and

a locking element bearing against said rear side of the reed and insertable into said aperture and provided with means for tightening said auxiliary member against the reed.

4,601,314

METHOD AND APPARATUS FOR OPERATING A WEAVING MACHINE

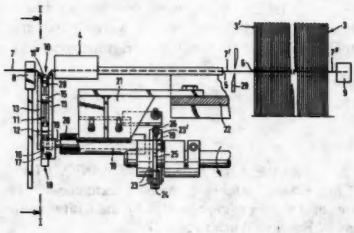
Paul Gunneman, Mierlo, Netherlands, assignor to Sulzer-Ruti Machinery Work, Ltd, Ruti, Switzerland

Filed Jan. 17, 1985, Ser. No. 692,205

Claims priority, application Switzerland, Jan. 19, 1984, 235/84

Int. Cl.⁴ D03D *47/00*

U.S. Cl. 139—429 **5 Claims**



1. A method of operating a weaving machine comprising the steps of

pneumatically picking a weft yarn into and through a shed with an excess length;

imposing a fluid stream on the forward end of the picked weft yarn to stretch the weft yarn;

thereafter pulling back the picked weft yarn on the picking side of the shed an amount equal to the excess length while beating-up the stretched weft yarn; and

severing the weft yarn while maintaining the pulling back of the weft yarn until shortly after severance.

2. A method of operating a weaving machine comprising the steps of

pneumatically picking a weft yarn into and through a shed with an excess length;

imposing a pneumatic stream on the forward end of the weft yarn to stretch the weft yarn within the shed;

beating-up the stretched weft yarn into a fabric;

forming a loop in the picked weft yarn upstream of the shed to pull back the weft yarn an amount equal to the excess length during beating-up of the weft yarn; and

severing the weft yarn while maintaining the pulling back of the weft yarn until shortly after severance.

4,601,315

TRASH BAG LOADING DEVICE FOR GARDEN CARTS AND THE LIKE

John W. France, P.O. Box 656, Rawlins, Wyo. 82301

Filed May 26, 1981, Ser. No. 267,333

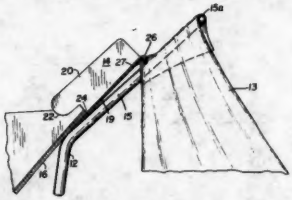
Int. Cl.⁴ B65B *1/06*

U.S. Cl. 141—231 **14 Claims**

1. As an article of manufacture a guide device for use on and for facilitating the transfer of trash from a garden cart or barrow of the type having an open top body and spaced handle

arms extending rearwardly from the rear end of the body adjacent the top thereof, said guide device comprising:

a flat generally rectangular rigid sheet member of a length to extend across and rest on the handle arms of the cart with the front edge of said sheet adjacent and under the rear wall of the cart, a forwardly opening straight channel member on the bottom of said sheet near the rear edge



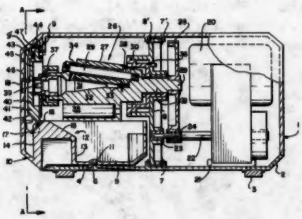
thereof, said channel being adapted to receive and closely hold a dowel stick or the like whereby an edge of a trash bag opening upwardly may be placed over a dowel stick and pressed therewith into the channel to secure the top of the bag to the sheet and whereby grass cuttings and similar trash may be swept by hand from the body of the cart over said sheet and into the bag.

4,601,316

ELECTRIC PENCIL SHARPENER

Anthony J. Verdi, Whippany, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.

Filed Sep. 30, 1985, Ser. No. 781,596
Int. Cl.[4] B43L *23/00*
U.S. Cl. 144—28.72 **8 Claims**



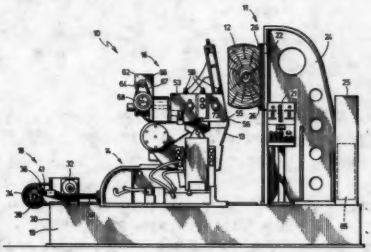
1. In an electrical pencil sharpener having a housing, a front wall and a slidable shaving accumulation tray, a power source, a switch and a motor, a cutter holding element rotatable in one direction by said motor when said switch is actuated, cutter means operatively carried by said cutter holding element and arranged to be rotated in a direction opposite to the rotational direction of said cutter holding element, the combination comprising said front wall of said housing having an aperture therein, said aperture in axial alignment with an aperture in said cutter means, vertically movable means provided with an aperture to control insertion of a pencil into said cutter means, said vertically movable means disposed between said housing front wall and said cutter means, said vertically movable means being movable from an operative pencil receiving position when said respective apertures are in alignment into a pencil blocking position to prevent insertion of said pencil when said shaving accumulation tray is removed from said housing.

4,601,317

VENEER SLICING SYSTEM

Robert D. Brand, Lawrence, Ind., assignor to Capital Machine Company, Inc., Indianapolis, Ind.

Filed Jan. 31, 1985, Ser. No. 697,026
Int. Cl.[4] B27L *5/06*
U.S. Cl. 144—178 **41 Claims**



1. Veneer-slicing apparatus, comprising:

a flitch table for supporting a flitch to be sliced;

a carriage;

a cutting blade mounted on said carriage for slicing veneer sheets from said flitch;

first drive means for reciprocating said flitch table and said flitch supported thereon in a first plane, each reciprocation of said flitch table including a slicing stroke and a return stroke;

second drive means for moving said carriage and said cutting blade mounted thereon in a second plane substantially perpendicular to said first plane, said second drive means includes means for moving said carriage and said cutting blade mounted thereon in a forward direction toward said flitch table prior to said slicing stroke for placing said cutting blade in position to slice a veneer sheet from said flitch during said slicing stroke, and for moving said carriage and said cutting blade mounted thereon in a rearward direction away from said flitch table and out of the path of said flitch prior to said return stroke, said first and second drive means including first and second drive motors for independently reciprocating said flitch table and moving said carriage, respectively; and

control means coupled to said second drive means for moving said carriage a first distance in said reverse direction and for moving said carriage a second distance in said forward direction, said second distance being equal to said first distance plus a distance equal to the desired thickness of the veneer sheet to be sliced from said flitch, said control means including means for setting the desired thickness of said veneer sheet to be sliced from said flitch, and means for determining the correct second distance in said forward direction to obtain veneer sheets of said desired thickness.

4,601,318

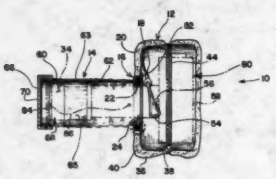
CAMERA AND LENS CASE

David Diegelman, P.O. Box 1631, Grass Valley, Calif. 95945

Filed Mar. 22, 1984, Ser. No. 592,349
Int. Cl.[4] G03B *17/00*; A45C *11/38*
U.S. Cl. 150—52 J **5 Claims**

1. A camera case comprising a camera body enclosing portion with an openable back, a lens enclosing portion, a connection joining said camera body enclosing portion and said lens enclosing portion which allows said lens enclosing portion to rotate with respect to said camera body enclosing portion while remaining attached to said camera body enclosing portion, said lens enclosing portion having a flexible band joining said connection and a remainder of said lens enclosing portion,

said lens enclosing portion being attached to said body enclosing portion by means of a pair of friction fitting rigid rings



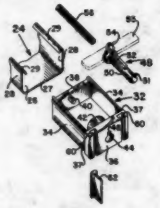
having a grooved region therebetween for insertion of an O-ring, and an O-ring in the grooved region.

4,601,319

INSTALLATION HARDWARE FOR VENETIAN BLIND IN A VAN WINDOW FRAME

George Georgopoulos, Pine Brook, N.J., assignor to Levolor Lorentzen, Inc., Lyndhurst, N.J.

Filed Apr. 6, 1984, Ser. No. 597,657
Int. Cl.[4] E06B *9/38*
U.S. Cl. 160—178 B **5 Claims**



1. A bracket for connecting a head rail of a venetian blind to a window frame, comprising: a bracklet body shaped to be fit and held in an end of said head rail, said bracket body having a front face to face away from said head rail with a top and bottom, a passage extending from said front face into said body, a pin slidably received in said passage, a spring mounted in said bracket body and engaging said pin so that a front end of said pin normally protrudes from said passage beyond said front face, said pin having a handle for retracting the front end of said pin into said body passage against the force of said spring, at least one groove in said front face between said top and bottom, and seal means in said at least one groove for closing a gap between said front face and a window frame.

4,601,320

INDUSTRIAL DOOR

Douglas Taylor, 49 Belcourt Ave., Barrie, Ontario, Canada (L4M 4S5)

Filed Feb. 9, 1984, Ser. No. 578,768
Int. Cl.[4] E06B *9/17*
U.S. Cl. 160—271 **21 Claims**

1. A pressure-differential compensating door assembly, comprising:

a flexible rubber or synthetic rubber curtain for closing a doorway having a first upper end, a second lower end and side edges;

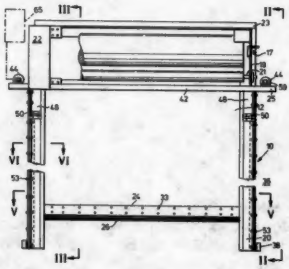
a curtain winding mechanism having said first end of said curtain attached thereto for raising said curtain by rolling said curtain up;

a pair of spaced apart, vertically extending, straight guide channel means, side edge sections of said curtain being movable in a straight path in said guide channel means and sealingly engageable therewith;

an open centered door frame including a horizontally extending upper portion and two, straight vertically extending side portions located at opposite ends of said upper portion, said guide channels being arranged on said vertically extending portions;

means at the bottom end of each of said vertically extending side portions for pivotally connecting said door frame to fixed door surrounding structure; and

door pressure releasing means adapted to connect said door frame in sealing engagement with said door surrounding



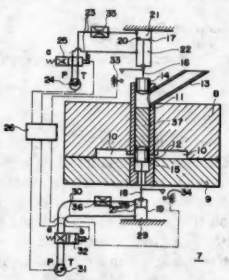
structure, said door pressure releasing means being operable to pivot said door assembly away from said door surrounding structure prior to said curtain being raised and to release any pressure differential existing on opposing sides of said curtain, said releasing means including two power expandable mechanisms each pivotally mounted at and supported by the upper end of said door frame and adapted for connection to the adjacent door surrounding structure.

4,601,321

VERTICAL DIE CASTING DEVICE

Masaaki Tokui, and Toshika Masaoka, both of Toyota, Japan, assignors to Toyota Kidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 609,513, May 10, 1984, abandoned, which is a continuation of Ser. No. 349,362, Feb. 16, 1982, abandoned. This application Jun. 26, 1985, Ser. No. 748,718
Int. Cl.[4] B22D *17/32*
U.S. Cl. 164—155 **3 Claims**



1. A vertical die casting device for charging molten metal into a mold cavity, comprising;

a pouring gate;

a cavity gate located below said pouring gate;

a sleeve connecting said pouring gate and said cavity gate;

an injection plunger tip inserted in the upper portion of said sleeve;

a counter tip inserted in the lower portion of said sleeve, said

plunger tip and said counter tip being disposed opposite to each other; and

means for preventing the application of pressure by said tips to the molten metal when the molten metal is charged into the mold cavity, including:

retracting means for causing said counter tip to move downwardly, continuously, from a first position in said sleeve at which access to said cavity gate by any molten metal in said sleeve is totally blocked to a second position in said sleeve at which access to said cavity gate by any molten metal in said sleeve is totally open, said retracting means comprising a first actuator;

activating means for causing said plunger tip to move downwardly, continuously, from a third position in said sleeve above said pouring gate to a fourth position in said sleeve adjacent said cavity gate, said activating means comprising a second actuator;

control means for causing said activating means to begin the downward motion of said plunger tip and for causing said retracting means to begin the downward motion of said counter tip when said plunger tip reaches a position approximating the expected upper level of molten metal in said sleeve when in use; and

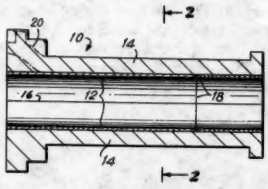
regulating means connected to said retracting means and activating means for causing said retracting means and said activating means to move said plunger tip and said counter tip at the same speed when both are in motion, said regulating means comprising equalization means for equalizing the rates of movement of said first and second actuators.

4,601,322

WELD FORMING OF PIPE MOLDS

Ashok K. Khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Mar. 13, 1984, Ser. No. 586,751
Int. Cl.[4] B22C *13/08*
U.S. Cl. 164—286 **40 Claims**



7. A process for making pipe molds for centrifugally casting pipes, the process comprising depositing weld deposited material on at least one surface of a plurality of rigid cylindrical shells welded together circumferentially with each rigid cylindrical shell having an inner surface and an outer surface, the deposited material presenting a uniform surface for pipe casting, and forming each rigid cylindrical shell from a formed and welded flat plate.

4,601,323

DUAL SLIDE CASTING OR MOLDING MACHINE

Maurice Doucet, St. Leonard, and Pierre Lamy, Chomedey, both of Canada, assignors to Techmire Ltee., Quebec, Canada

Filed Mar. 18, 1985, Ser. No. 712,741
Claims priority, application Canada, Mar. 8, 1985, 476,062
Int. Cl.[4] B22D *17/00, 17/26, 33/04*
U.S. Cl. 164—312 **2 Claims**

1. A machine for the injection molding or die casting of parts, said machine comprising:

(a) a machine base including a front face, a rear face at least one side face, a top portion and an aperture, said aperture being generally located centrally in said machine base;

(b) an injection unit mounted on the rear face of said machine base;

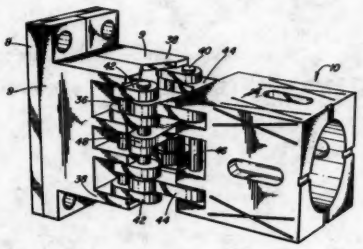
(c) a guideway having two ends mounted on the front face of said machine base, said guideway having a base plate, a front cover and sidewalls and said guideway enclosing a toggle assembly in each of said two ends, said toggle assembly comprising:

(i) a pair of compression lever brackets having end portions and a platen member secured to a first end of said two ends of said guideway;

(ii) shank means for carrying mold means in said guideway, said shank means having a first end located adjacent to said compression brackets;

(iii) actuating means mounted in association with said compression lever brackets and said platen at said first end of said guideway;

(iv) means for interconnecting said compression lever brackets with said shank means, including a first pair of pivot pins mounted in said end portions of said compression lever brackets;



(v) a second pair of pivot pins located substantially parallel to said first pair of pins, and pivotally connected to said first pair of pins by compression levers;

(vi) a third pair of pivot pins located substantially parallel to said first and second pairs of pins, said third pair of pins mounted in said first end of said shank means and compression arms pivotally connecting said second pair of pins with said third pair of pins; and

(d) connecting means for operatively connecting said actuating means with said shank means, to permit reciprocation of said shank means and said mold means mounted on said shank means in said guideway, said connecting means comprising:

(i) a fourth pivot pin generally located centrally between of said first, second and third pairs of pivot pins;

(ii) means connecting said fourth pin to said actuating means;

(iii) link members for connecting pivotally said fourth pin to said second pair of pins;

(e) an aperture in the base plate of said guideway in communication with the aperture in said machine base.

4,601,324

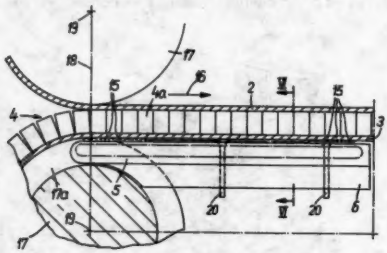
BELT SUPPORT FOR A TWIN-BELT CONTINUOUS CASTING MOLD

Gerd Artz, Ratingen; Gerhard Beckmann; Dieter Figge, both of Essen, and Clemens Philipp, Meerbusch, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,163
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431316
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—432 **13 Claims**

1. In a twin-belt continuous casting apparatus including a mold chamber defined by upper and lower travelling casting belts and travelling side dams bounded by the casting belts; said chamber having an inlet and an outlet downstream of said

inlet as viewed in a travelling direction of the casting belts and the side dams; said travelling direction defining a casting direction of said apparatus and the distance between said inlet and said outlet defining the length of said mold chamber; end drums arranged at said inlet and said outlet; said casting belts being trained about respective said end drums; a central support assembly extending along a first length portion of said mold chamber between said inlet and said outlet; said central support assembly being in alignment with said mold chamber and being arranged for backing up a respective said casting belt at a plurality of locations; and lateral support assemblies extending along a second length portion of said mold chamber; said lateral support assemblies being in alignment with a respective said side dam and being arranged for backing up a respective said casting belt along said second length portion against the side dams; the improvement wherein each lateral support assembly comprises a plurality of serially-arranged



rolling bodies having rotary axes extending generally parallel to an adjacent said casting belt and perpendicularly to said casting direction; guiding means for guiding each rolling body for a rolling advancement in said casting direction through said second length portion while contacting a respective said casting belt and for returning each rolling body from a downstream end of said second length portion to an upstream end thereof while being out of contact with and oriented away from the casting belt; said second length portion extending substantially from said inlet of said mold chamber and having a length which is, at the most, one fourth of the length of said mold chamber; during casting operation there being at any time a plurality of said rolling bodies in contact with a respective said casting belt along said second length portion at a plurality of locations spaced from one another parallel to said casting direction; and further wherein said central support assembly comprises a plurality of rotatably supported rollers arranged in series along said first length portion.

4,601,325

EXTRUSION

Brian Maddock, Broadstone, England, assignor to Alform Alloys Limited, Dorset, England

Filed Nov. 21, 1983, Ser. No. 553,967

Claims priority, application United Kingdom, Nov. 26, 1982, 8233820

Int. Cl.[4] B22D *11/00, 11/12*

U.S. Cl. 164—476 **6 Claims**

1. An extrusion apparatus, comprising:

a wheel rotatable about a horizontal axis and having an endless groove extending around its periphery;

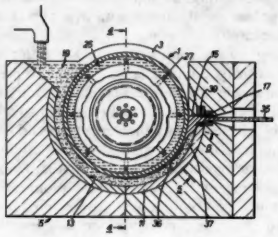
a fixed structure covering said groove along part of the length of said groove to define a passageway therebetween;

a blocking member which projects into said groove to close one end of said passageway;

a die orifice supported by the structure and leading from the closed passageway adjacent said blocking member to the exterior of said passageway;

means for rotating said wheel relative to said fixed structure;

means for introducing molten metal into said passageway at a position away from said blocking member; and



means for fluid cooling only the portion of the wall of said passageway defined by said wheel to cause said metal to form a pasty semi-solid material having a solidified skin in the area of contact with said cooled wall.

4,601,326

RIBBON CASTING APPARATUS WITH MAGNETIC RETAINER AND RESILIENT SPACER

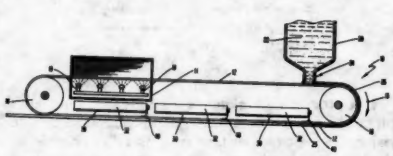
Christian J. Zingler, Succasunna, N.J., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 471,996, Mar. 4, 1983, abandoned. This application May 20, 1985, Ser. No. 736,285

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[4] B22D *27/02, 11/06*

U.S. Cl. 164—502 **14 Claims**



1. An apparatus for casting a continuous ferromagnetic ribbon, comprising:

(a) a reservoir for molten metal;

(b) means for dispensing a relatively thin, elongated ribbon from molten metal in the reservoir;

(c) a continuously moving substrate, said substrate including a casting surface for receiving and quenching the dispensed ferromagnetic metal ribbon;

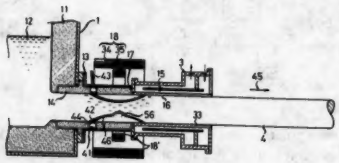
(d) attracting means disposed proximal to said substrate for applying an attractive force to retain the cast ribbon against the substrate; and

(e) spacer means secured in contacting relationship with said substrate for separating the substrate from the attracting means, said spacer means being flexible and resilient in the direction of substrate movement so as to flex under the interaction force with the substrate and bias the substrate away from said attracting means.

4,601,327
HORIZONTAL CONTINUOUS CASTING INSTALLATION

Hideo Kaneko; Hatuyoshi Kumashiro, and Akira Iwata, all of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 14, 1982, Ser. No. 388,399
Claims priority, application Japan, Jun. 17, 1981, 56-94333
Int. Cl.[4] B22D *11/00, 27/02*
U.S. Cl. 164—502 1 Claim



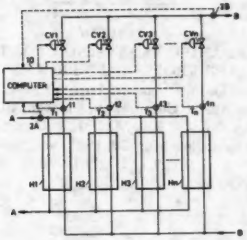
1. In a horizontal continuous casting installation comprising:
a tundish for storing a body of molten metal;
a tundish nozzle secured to said tundish near its bottom and extending horizontally therefrom;
a mold positioned at the forward end of said tundish nozzle for continuously receiving a supply of molten metal stored in said tundish to cast said body of molten metal into a strand adapted to be continuously withdrawn from said mold in a horizontal direction; and
electromagnetic field generating means mounted to enclose the vicinity of the boundary between said tundish nozzle and said mold thereby to generate an electromagnetic force oriented toward the center axis of and exerted on said body of molten metal flowing through said boundary,
the improvement wherein:
said electromagnetic field generating means comprises means for generating a magnetic flux of higher density in a lower portion of said body of molten metal than in an upper portion thereof;
said electromagnetic field generating means having coils comprising said electromagnetic field generating means and means energizing said coils with an energizing current having a wave form distorted with the variation in absolute current value thereof in the region where the absolute current value decreases being greater than in the region where it increases;
an electromagnetic force absorbing and conducting plate interposed between said coils and said molten metal;
and said coils being arranged in two layers spaced apart from said tundish nozzle and said mold in enclosing relation thereto, said two layers of coils comprising an outer coil arranged coaxially with a tundish nozzle and the mold, and an inner coil having an axis spaced upwardly from the axes of said tundish nozzle and mold, to thereby generate said magnetic flux of higher density in a lower portion of the body of molten metal than in an upper portion thereof.

4,601,328
METHOD AND APPARATUS FOR THE TEMPERATURE BALANCING CONTROL OF A PLURALITY OF HEAT EXCHANGERS

Yasuo Tasaka; Sadao Masuda, and Kiyoshi Sasaki, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,526
Claims priority, application Japan, Sep. 21, 1983, 58-172919
Int. Cl.[4] G05D *23/00;* F28F *27/02*
U.S. Cl. 165—12 6 Claims

1. An apparatus for the temperature control of a plurality of heat exchangers comprising:
a plurality of heat exchangers connected for use in parallel for effecting heat exchange, between a heating medium and a medium to-be-heated; temperature sensors for sensing the temperatures of the heating medium or the medium to-be-heated provided in said heat exchangers respectively; regulation means for controlling temperatures of the medium to-be-heated in the heat exchangers respectively; and arithmetic control means having first means for calculating a first difference between the respective sensed temperature values and a temperature setting value of the medium to-be-heated, and for calculating control signals for said regulation means using said first difference

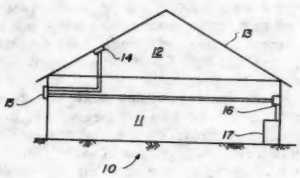


for balancing temperatures of the medium to-be-heated which flows out of the respective heat exchangers, second means for selecting the maximum value of said control signals calculated by said first means, third means for calculating a second difference between said maximum value and a preset reference value, and for revising all the control signals on the basis of the second difference, and fourth means for supplying the revised signals to said regulation means respectively.

4,601,329
AUTOMATIC TEMPERATURE CONTROL

John P. Sheridan, 5008 N. 35th St., Arlington, Va. 22207

Filed Aug. 31, 1983, Ser. No. 528,065
The portion of the term of this patent subsequent to Aug. 22, 2002, has been disclaimed.
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—22 2 Claims



1. An automatic temperature control system for maintaining a preset temperature in an enclosed space in a building, comprising:
heating and cooling means for conditioning the air in the enclosed space to maintain the preset temperature;
exterior thermostat means outside the building for sensing ambient exterior temperature levels;
interior thermostat means in the enclosed space, preset to the preset temperature to be maintained and connected with the heating and cooling means to energize said means for heating or cooling, as appropriate, when the preset temperature is reached;
means defining a heat sink containing a volume of air heated by solar radiation, the volume of the heat sink being such that the temperature level therein is not affected by minor or temporary ambient temperature fluctuations; and
heat sink thermostat means in the heat sink sensing the temperature in the heat sink, said heat sink thermostat means being

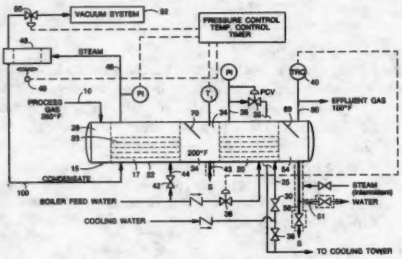
connected in tandem with the exterior thermostat means and operative with the exterior thermostat means to switch the interior thermostat means to either a first readiness state for heating or a second readiness state for cooling, depending upon which mode is indicated by both the exterior and heat sink thermostat means, whereby said system automatically switches between heating and cooling, as required, in response to a comparison of exterior and heat sink temperatures.

4,601,330

COOLING AND CONDENSING OF SULFUR AND WATER FROM CLAUS PROCESS GAS

John W. Palm, Tulsa, Okla., and Lorenz V. Kunkel, Tyler, Tex., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 499,668, May 31, 1983, Pat. No. 4,526,590.
This application Mar. 20, 1985, Ser. No. 713,964
Int. Cl.[4] B22D *19/14*
U.S. Cl. 165—95 **5 Claims**



1. An apparatus for condensing and removing vaporized elemental sulfur and water from a gas stream, said apparatus comprising:

first heat exchange means;

second heat exchange means communicating with said first heat exchange means;

means for directing said gas stream through said first heat exchange means and said second heat exchange means;

first means for maintaining said gas stream passing through said first heat exchange means in a temperature range that effects condensation and solidification of a first portion of sulfur therefrom, said first portion comprising most of the sulfur from the gas stream;

second means for maintaining said gas stream passing through said second heat exchange means in a temperature range that effects condensation of water, and solidification of a remaining portion of sulfur therefrom;

means for removing recovered sulfur and water from said first and said second heat exchange means; and

means for periodically increasing the temperature of said first heat exchange means to melt solid sulfur accumulated therein and for periodically increasing the temperature of said second heat exchange means to melt solid sulfur accumulated therein.

4,601,331

MULTIPLE HEAT PIPES FOR LINEAR BEAM TUBES HAVING COMMON COOLANT AND VAPORIZING SURFACE AREA ENHANCEMENT

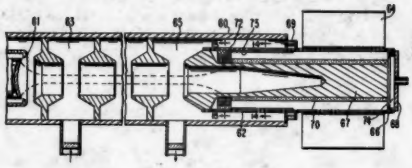
Sebastian W. Kessler, Jr., San Mateo, and Gordon R. Lavering, Belmont, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 23, 1985, Ser. No. 768,541
Int. Cl.[4] H01J *7/28*; F28D *15/00*
U.S. Cl. 165—104.33 **11 Claims**

1. An apparatus for cooling a linear beam tube having a beam collector, comprising:

heat pipe means for conducting heat from a beam collector to an outer extremity of the tube, said heat pipe means including

a multiplicity of channels formed integrally to a tube cavity wall from the vicinity of the beam collector to the outer extremity, said channels being partially filled with a liquid,



area enhancement rods formed in said heat pipe means in the vicinity of the beam collector, said area enhancement rods extending from a wall closest to a surface where an electron beam impinges on the beam collector, said area enhancement rods not extending to an opposite wall, and

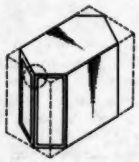
a wick of porous materials formed on the walls of said channels.

4,601,332

CERAMIC RECUPERATIVE HEAT EXCHANGERS AND A METHOD FOR PRODUCING THE SAME

Isao Oda, and Tadaaki Matsuhisa, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 243,698, Mar. 16, 1981, Pat. No. 4,421,702.
This application Nov. 10, 1983, Ser. No. 537,691
Claims priority, application Japan, Mar. 24, 1980, 55-37333
Int. Cl.[4] F28F *1/04*
U.S. Cl. 165—165 **4 Claims**



1. A ceramic recuperative heat exchanger comprising:

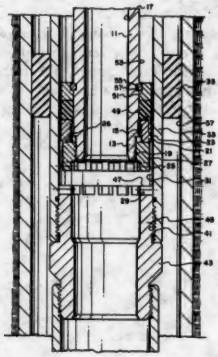
a first plurality of parallel channels which carry a first heat transfer medium, said first plurality of parallel channels being defined by partition walls which have been formed by an extrusion process, said channels having a cross-sectional shape of a triangle, a quadrilateral or a hexagon;

a second plurality of parallel channels which carry a second heat transfer medium, said second plurality of channels being in a heat transfer relationship with said first plurality of channels and being defined by partition walls which have been formed by an extrusion process and by subsequently cutting off to a given depth selected partition walls in an axial direction of the channels and sealing only end surfaces of said second plurality of parallel channels such that an open frontal area of a heat transmitting portion of said heat exchanger is greater than 60% and said partition walls have a porosity of not greater than 10%.

4,601,333
THERMAL SLIDE JOINT

Robert W. Evans, Huntsville, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Apr. 29, 1985, Ser. No. 728,018
Int. Cl.[4] E21B *33/128*
U.S. Cl. 166—115 7 Claims



1. A slide joint for sealing the annular space between the outer surface of a floating tubular member and the inner bore of a surrounding conduit in a well bore, comprising:

a cylindrical floating member having upper connecting means for connection in a well tubing string extending to the well surface and an outer cylindrical surface;

a clutch element carried on said floating member, said clutch element having an upper portion and downwardly extending clutch portions;

a circumferential, compressible packing ring located on said floating member outer surface between said clutch element upper portion and a fixed nut carried on said outer surface;

and wherein said inner bore of said surrounding conduit is provided with mating recesses for receiving the clutch portions of said clutch element when said floating member is run into position within said well conduit so that rotation of said clutch element causes said clutch element to travel axially up said floating member outer surface to compress said packing ring.

4,601,334
CONTROL LINE PROTECTOR FOR OIL WELL TUBING STRING

Peter J. Lovegrove, Lowestoft, United Kingdom, assignor to Weatherford/Lamb, Inc., Houston, Tex.

Filed Apr. 9, 1984, Ser. No. 597,852
Claims priority, application United Kingdom, Apr. 7, 1983, 8309424
Int. Cl.[4] F16L *3/22*
U.S. Cl. 166—241 12 Claims

1. A control line protector for application to a tubing string comprising:

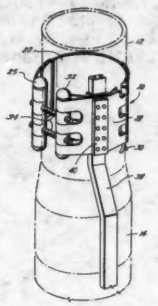
a partly cylindrical flexible strap;

a second member co-operable with the strap to encircle the tubing string;

means on the second member defining a channel for housing at least one control line and locating such at least one line relative to the protector;

means connecting one end of the second member to the strap, said means comprising releasable hinge means having a removable pin; and

means connecting the other end of the second member to the strap, said means comprising trunnions mounted one in each of the adjacent ends of the strap and the second member and clamping screws extending between the trunnions and adjustable for tensioning the strap and

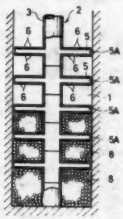


drawing same into clamping engagement with the tubing string.

4,601,335
WELL DEVICE

Yoshio Murahashi, Kokubunji, Japan, assignor to Asia Suigen Co., Ltd., Japan

Filed Aug. 20, 1984, Ser. No. 642,217
Claims priority, application Japan, Dec. 5, 1983, 58-228474
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—242 4 Claims



1. Well apparatus which comprises:

a well bore containing a central suction pipe and means for pumping water through said suction pipe out of the well bore;

a predetermined plurality of water collecting units disposed in said well bore secured to said suction pipe at spaced intervals therealong said suction pipe beginning at the bottom of said bore in ground water layer of the bore;

each of said units having horizontal portions extending outwardly from said suction pipe to a region adjacent the exterior of said bore with vertically disposed intake openings to allow water to flow through said horizontal portions into said suction pipe;

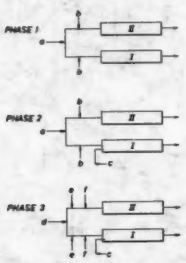
the total area of said intake openings being sufficient to provide a reduced flow speed of ground water and prevent breakdowns of the water bearing strata and discontinuity of the well.

4,601,336

PROCESS FOR SELECTING A STEAM FOAM FORMING SURFACTANT

Richard E. Dilgren, Houston, and Kenneth B. Owens, Spring, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 17, 1984, Ser. No. 651,388
Int. Cl.[4] E21B *43/22*; G01N *15/00*
U.S. Cl. 166—252 6 Claims



1. In a process in which oil is displaced within a subterranean reservoir by injecting steam and surfactant-containing steam-foam-forming components to form a steam-containing fluid having less mobility than steam alone and thus having a greater tendency to avoid bypassing oil, an improved procedure for selecting which of a plurality of surfactant materials is the most effective for both avoiding oil bypassing and efficiently displacing the oil contained within a particular reservoir, comprising:

mixing steam with each of a plurality of surfactant materials to form a plurality of steam foams which are substantially equivalent except for the compositions of the surfactant materials;

displacing each of said foams into and through a pair of substantially equally available and equally permeable porous materials while concurrntly displacing an oil which is or is substantially equivalent to the reservoir oil through one of the permeable porous materials and measuring both the proportion of each of said foams which flows through the respective oil-free and oil-containing permeable material and the extent to which the foam removes the oil from the oil-containing material, in order to compare the capabilities of each of the surfactant materials with respect to both the mobility controlling and oil removing aspects when the foams formed by them have equal opportunities to flow through either a path which is oil-free or one which is oil-containing.

4,601,337

FOAM DRIVE OIL DISPLACEMENT WITH OUTFLOW PRESSURE CYCLING

Hon C. Lau, and Stephen M. O'Brien, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 10, 1984, Ser. No. 609,062
Int. Cl.[4] E21B *43/16*
U.S. Cl. 166—263 9 Claims

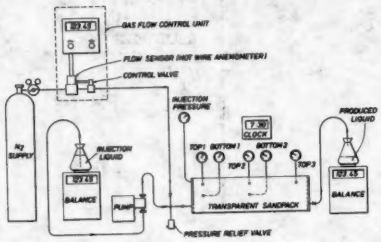
1. In a process for recovering oil from an oil-containing subterranean reservoir, in which process the reservoir has a base matrix which is substantially free of fractures or streaks having a permeability drastically different from the base matrix, said reservoir is encountered by at least one each of injection and production wells, and oil is displaced toward a production well by injecting a mixture of aqueous liquid, gaseous fluid and surfactant, an improvement comprising:

injecting through at least one injection well a foam forming fluid consisting essentially of said mixture in which said gas, aqueous liquid and surfactant are substantially homogeneously mixed before entering the reservoir and are capable of forming a relatively strong foam within the pores of the reservoir;

during said injection, allowing little or no fluid outflow through any adjacent production well, so that the fluid pressure within the reservoir and within at least one adjacent production well becomes at least substantially doubled relative to the normal reservoir pressure near the production well;

outflowing fluid from at least one production well in which the pressure increase has occurred, at an outflow rate sufficient to reduce the reservoir pressure;

during said outflow continuing the injection of said foam forming fluid through at least one injection well at a rate at least substantially equalling the initial rate;



when the reservoir pressure on the fluid being outflowed from said production well has significantly declined, allowing little or no fluid outflow through that well while continuing to inject said foam forming fluid through at least one injection well at a rate at least substantially equalling the initial fluid injection rate, so that the pressure is again increased within the reservoir and at least one production well adjacent to the injection well; and

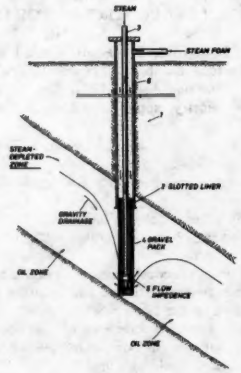
repeating said sequence of injecting the foam forming fluid while restricting fluid outflow and producing fluid while continuing fluid injection, and recovering oil from the fluid being produced.

4,601,338

FOAM AND IMPEDANCE-GUIDED STEAM INJECTION

Michael Prats, Houston, Tex., and Paul B. Ritter, Jr., Bakersfield, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 4, 1985, Ser. No. 698,198
Int. Cl.[4] E21B *43/04*, *43/24*
U.S. Cl. 166—278 10 Claims



1. In a well treating process within a reservoir in which a

gaseous fluid is injected through tubing surrounded by a permeable-walled conduit in a manner tending to provide a preferential inflow into a selected portion of the reservoir, an improvement comprising:

in a location near but above that at which the gaseous fluid is to be injected into the reservoir, introducing solid granules into the space between the permeable-walled conduit and the reservoir to an extent sufficient to ensure that the vertical permeability in that space is not significantly more than the permeability provided by the interstices between a mass of gravel-sized solid particles;

positioning a mechanical fluid-flow-impeding means within the annulus between the tubing string and the permeable-walled conduit at a depth which is below the top of said mass of gravel-sized particles and is just above the depth at which the gaseous fluid is to be injected into the reservoir;

injecting fluid which is significantly more viscous than the gaseous fluid through the annulus and into said mass of particles above the mechanical flow impeding means at a rate and pressure such that the fluid pressure near the impedance exceeds the pressure at which the gaseous fluid is to be injected into the reservoir; and

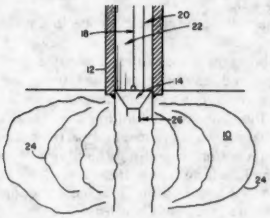
injecting the gaseous fluid through the tubing string and into the reservoir below the mechanical flow impeding means.

4,601,339

METHOD FOR PLUGGING A WELLBORE IN HIGH IMPULSE FRACTURING

Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,430
Int. Cl.⁴ E21B *33/134, 43/263*
U.S. Cl. 166—281 **20 Claims**



1. A method for sealing a wellbore with a pumpable gel mixture after placing a canister containing a propellant into a wellbore wherein said gel mixture subsequenty solidifies and when solidified is capable of withstanding energy released from ignition of said propellant comprising the steps of:

(a) placing a means for containing the pumpable gel mixture at a predetermined level in the wellbore above said canister which is suspended at or above ground level;

(b) pumping a gel mixture into the wellbore above the means for containing the pumpable mixture;

(c) causing said gel mixture to become a solid sufficient to withstand the energy released from an ignited propellant, including heat and pressure; and

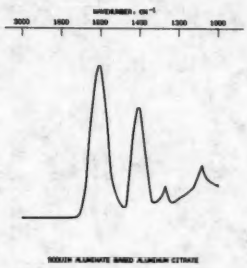
(d) igniting said propellant whereby said solid gel withstands energy released from said propellant including heat and pressure.

4,601,340

ALUMINUM CITRATE SOLUTION

Lawrence M. Fodor, and R. Lynn Cobb, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 24, 1983, Ser. No. 525,911
Int. Cl.⁴ E21B *33/13;* **C09K** *3/00;* **C07F** *5/06*
U.S. Cl. 166—294 **19 Claims**



1. In an enhanced oil recovery process wherein a polymer selected from carboxymethylcellulose and partially hydrolyzed polyacrylamide is contacted with an aluminum citrate solution, the improvement comprising using as the aluminum citrate solution a stable aqueous solution of aluminum citrate having an aluminum to citrate molar ratio of 1.4/1 to 2.3/1 prepared by combining citric acid or sodium citrate and an aqueous solution of sodium aluminate at a temperature below 40° C. followed by neutralization with organic or inorganic acid to a pH in the range of 6 to 9 conducted at a temperature below 40° C.

4,601,341

FLEXIBLE PISTON WELL SAFETY VALVE

Ronald E. Pringle, and William D. Eatwell, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Mar. 18, 1985, Ser. No. 713,080
Int. Cl.⁴ E21B *34/10*
U.S. Cl. 166—321 **14 Claims**

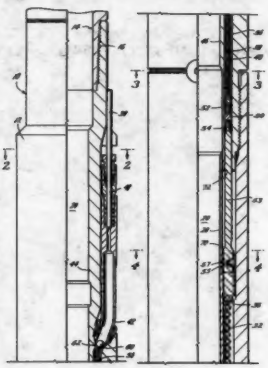
1. In a subsurface well safety valve for controlling the fluid flow through a well conduit and including a housing having a bore and a valve closure member in the bore moving between open and closed positions, a flow tube telescopically movable in the housing for controlling the movement of the valve closure member, means for biasing the flow tube in a direction for allowing the valve closure member to move to the closed position, the improvement in means for moving the flow tube in a direction for opening the valve closure member comprising,

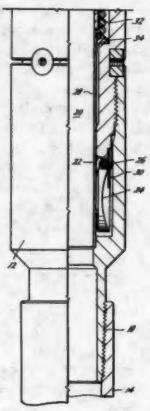
said housing having a cylinder including a straight and a non-straight portion and a port in communication with the cylinder and adapted to receive hydraulic fluid from the well surface, said non-straight portion being positioned above the straight portion,

a piston movable in the cylinder and contacting the flow tube, one side of the piston being in communication with the port for being exposed to hydraulic fluid for moving the flow tube in a direction to open the valve closure member,

said piston including a flexible portion and a straight portion, said flexible portion positioned above the straight portion

for moving through the non-straight portion of the cylinder, and





a valve element and valve seat in the cylinder between the port and said one side of the piston for holding the piston in the open position.

4,601,342

WELL INJECTION VALVE WITH RETRACTABLE CHOKE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Mar. 11, 1985, Ser. No. 710,360

Int. Cl.[4] E21B *43/12*

U.S. Cl. 166—323 **5 Claims**

1. An injection valve for use in a well conduit comprising,

a housing having a bore,

a valve closure member in the bore moving between open and closed positions,

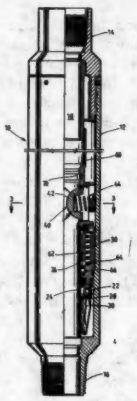
a flow tube telescopically movable in the housing for controlling the movement of the valve closure member,

means for biasing the flow tube in a direction for allowing the valve closure member to move to the closed position,

an expandable and contractible fluid restriction connected to the flow tube and extending into the bore for moving the flow tube to the open position in response to injection fluid, but allowing the passage of well tools through the valve, said restriction contractible in response to fluid flow,

said restriction includes,

a plurality of segments movable into and out of said bore, and



biasing means yieldably urging said segments into said bore,

a no-go shoulder on the flow tube, and

releasable lockout means between the flow tube and the housing for locking the flow tube and valve in the open position.

4,601,343

PBR WITH LATCHING SYSTEM FOR TUBING

Hiram E. Lindsey, Jr., Midland; Roger P. Allwin, and John M. Yokley, both of College Station, all of, assignors to MWL Tool and Supply Company, Midland, Tex.

Filed Feb. 4, 1985, Ser. No. 698,145

Int. Cl.[4] E21B *23/02*

U.S. Cl. 166—382 **8 Claims**

1. A polished bore receptacle for use in a wellbore comprising:

polished bore receptacle means adapted for location in a wellbore and having a polished bore for slidably and sealingly receiving a sealing assembly on a tubing string;

travel limiting means for limiting the travel of a string of tubing having a sealing assembly arranged for sliding and sealing reception in said polished bore receptacle means,

said travel limiting means including

a tubular locking housing adapted for coupling to a polished bore receptacle means,

said locking housing having J-slot means for receiving locking pins;

a tubular locking sleeve slidably and rotatively mounted on a tubular mandrel for limited travel between spaced apart upper and lower shoulder means, said locking sleeve having pin means for engaging said J-slot means, said tubular mandrel being adapted for connection between a sealing assembly and a string of tubing,

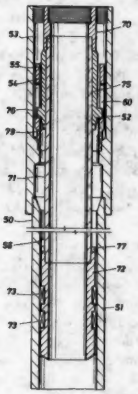
and clutch means on said lower shoulder means and on said locking sleeve for selective engagement for rotating said tubular locking sleeve out of locking engagement with said locking housing.

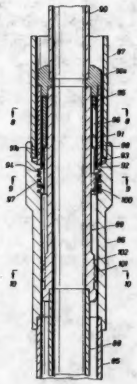
7. A method for limiting the travel of a sealing assembly within a polished bore receptacle disposed within a well bore above a liner hanger and depending string of pipe comprising the steps of:

positioning a polished bore receptacle in a fixed relationship with respect to a liner hanger in a well bore at a desired

location where said polished bore receptacle has latching means including a J-slot;

lowering a tubular sealing assembly with an outer seal means by means of a string of tubing into sealing engagement of the outer seal means with the polished bore receptable; and





releasably latching a pin means on the sealing assembly to the J-slot of said polished bore receptacle for preventing any substantial relative travel of said sealing assembly with respect to the polished bore receptacle until such time as the pin means on the sealing assembly is released from the J-slot in the polished bore receptacle.

4,601,344

PYROTECHNIC FIRE EXTINGUISHING METHOD

Russell Reed, Jr.; May L. Chan, both of Ridgecrest, Calif., and Kenneth L. Moore, Cabin John, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1983, Ser. No. 548,899
Int. Cl.⁴ C06B *45/10*
U.S. Cl. 169—47 **6 Claims**

1. A method of extinguishing a fire comprising the steps of: providing a gas generating composition comprises glycidyl azide polymer and a high nitrogen content additive selected from the group consisting of guanylaminotetrazole nitrate, bis(triaminoguanidium) 5,5'-azotetrazole, ammonium 5-nitraminotetrazole and high bulk density nitro guanidine in a reservoir;

igniting said composition to generate nitrogen gas; and

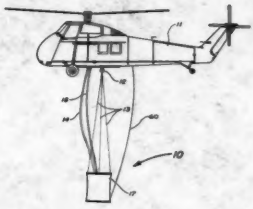
conveying said nitrogen gas from said reservoir to said fire.

4,601,345

MIXING AND DROP SYSTEM FOR FIRE RETARDANTS

David M. Mahrt, 2566 Christian Ave., Redding, Calif. 96002

Filed Jun. 10, 1985, Ser. No. 742,955
Int. Cl.⁴ A62C *28/00, 31/30*
U.S. Cl. 169—53 **2 Claims**



1. A mixing and drop system for use with liquid fire retardant concentrate with helicopters in fighting fires, comprising:

a hanging bucket attached to said helicopter by attaching means so that said bucket hangs down below said helicopter;

a reservoir for holding said liquid fire retardant concentrate;

a chemical line for conveying said liquid fire retardant concentrate from said reservoir to said hanging bucket;

pumping means for pumping said liquid fire retardant concentrate from said reservoir through said chemical line to said hanging bucket;

metering means for controlling the amount of said liquid fire retardant concentrate pumped from said reservoir to said hanging bucket;

mechanical mixing means consisting substantially of a propeller attached to an electric motor, positioned substantially inside of said bucket for agitating and mixing said liquid fire retardant concentrate from said reservoir with water inside said bucket to create an effective mixture of fire retardant, and

dumping means, operable from said helicopter, for dumping said effective mixture of fire retardant from said bucket onto a fire.

4,601,346

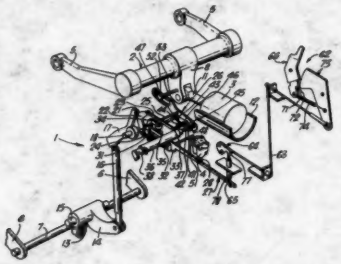
UNIT CONNECTED TO A TRACTOR FOR RAISING AND LOWERING AN AGRICULTURAL IMPLEMENT

Angelo Gregorio, Modena, Italy, assignor to Fiat Trattori, S.p.A., S.Matteo Modena, Italy

Filed Sep. 13, 1984, Ser. No. 650,616
Claims priority, application Italy, Sep. 30, 1983, 3750 A/83
Int. Cl.⁴ A01B *63/112*
U.S. Cl. 172—7 **5 Claims**

1. A unit for raising or lowering an agricultural implement, said unit connected to a tractor and comprising a means for attaching an implement to a tractor, a means for raising the said implement including a hydraulic distributor (4) having a valve (28), a means for controlling and adjusting the implement including two control levers positionable to selected positions and a linkage system including an operating lever disposed between the said attaching means and the said raising means and operable to determine the operating conditions of the said implement, characterised by the fact that the controlling means includes a means (61 or 83) for selectively raising and lowering said implement and having a first override lever (64,87) and a

resilient means (81, 88) for causing said first lever to assume a first position wherein said first override lever acts on said operating lever (27) of the said controlling means to control the position of said valve (28) of said hydraulic distributor (4) of the said raising means, and a second position wherein said first override lever acts against the biasing force of the said resilient means (81,88), and releases the said operating lever (27); said first override lever (64,87), in said first position, causing the said distributor (4) to assume its supply position and thereby causing the said implement to be raised, said operating lever (27) being unaffected by the operation of the said first override lever (64,87) when said first override lever is in its second position and thereby permitting the said distributor (4) to move to its discharge position and causing the said implement to be lowered and to return to its initial operating condition, said initial operating condition of said implement being determined by said two control levers of the said controlling means which remain positioned in their selected positions during the operation of the said selective raising and lowering means (61,83).

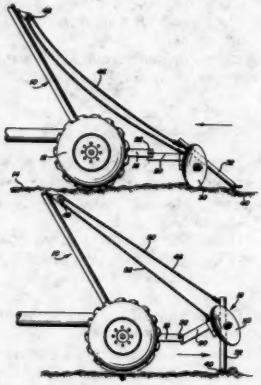


4,601,347

AUTOMATIC REVERSIBLE WHEEL TRACK FILLER

Carl D. Parish, Earth, Tex., assignor to K.M.P. Manufacturing Co., Inc., Earth, Tex.

Filed Nov. 29, 1983, Ser. No. 556,040
Int. Cl.[4] A01B *63/08*; B66F *7/22*
U.S. Cl. 172—134 7 Claims



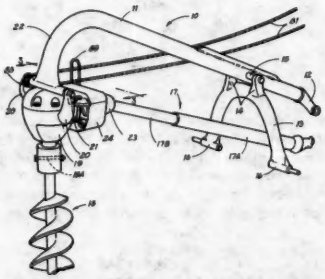
1. A wheeled structure adapted to move over the ground in forward and reverse directions, a wheel track filler including an elongated arm having front and rear end portions, attaching means pivotally attaching said front end portion to said wheeled structure for vertical swinging of said arm about a first horizontal axis transverse to said arm and said directions between a lowered rearwardly projecting position and a raised rearwardly and upwardly inclined position, said rear end portion of said arm including tracking-filling means operative to engage the ground along a depressed wheel track of said wheeled structure and to at least partially fill said wheel track by displacing at least some ground material thereinto from at least one side of the track as said wheeled structure moves forwardly along the ground, an elongated lever, pivot means pivotally supporting said lever from the rear end portion of said arm for swinging about a second horizontal axis transverse to said lever and said directions between a rearwardly and downwardly inclined trailing position with rear end of said lever engaging the ground behind said track-filling means and an upright forwardly displaced position, said rear end of said lever including ground digging means operative to slide over the ground, at least substantially without digging thereinto, when said wheeled structure is forwardly moved over the ground and to dig into the ground when said wheeled structure is rearwardly moved over the ground and cause said lever to pivot in a first direction about said pivot means toward said upright position and to thereby elevate said second axis and the track-filling means supported from the rear end of said arm relative to said ground, and motion transmitting connecting means operatively connected between said lever, wheeled structure and arm, responsive to said lever being swung to said upright position, operative to exert a lifting force on the rear end portion of said arm responsive to swinging of said lever in said first direction from said trailing position toward said upright position, whereby an equilibrium of forces is achieved between the force developed by frictional engagement of said digging means with the ground during said rearward movement tending to further swing said lever in said first direction and the force exerted on said rear end portion of said arm by said connecting means to further elevate the rear end portion of said arm, and thus said ground digging means relative to said structure, which further elevation of said ground digging means functions to reduce said frictional engagement and thus said force tending to further pivot said lever in said first direction.

4,601,348

REVERSIBLE AUGER DRIVE KIT FOR POST HOLE DIGGER

Floyd E. Cox, 2200 G. Bushnell Dr., Columbia, Mo. 65201

Filed Aug. 24, 1984, Ser. No. 644,065
Int. Cl.[4] E21B *7/02*
U.S. Cl. 173—25 6 Claims



1. In an auger drive arrangement in which there is an auger driving head with a power input receiving pinion shaft projecting from the driving head, a bidirectional drive kit for the driving head comprising:

(a) a reversible power transmission assembly connected to the input pinion shaft, and in which assembly there is:

1. A power input receiver formed with angularly directed splines thereon and being connected to the pinion shaft and an arrangement of a pair of gears carried by said

receiver and having cooperating half-step positive interlocking ramps thereon adapted in a first position to hold said gears engaged with each other and through said receiver splines with the input pinion shaft for transmitting power through the input pinion shaft to drive the auger in a first direction of rotation, one gear of said pair of gears being fixed to said receiver and the other gear of said pair of gears being slidably connected to said receiver through said splines;

2. lever means in the assembly for selectively separating said pair of gears by sliding said other gear on said receiver splines thereby interrupting the first direction of auger rotation and for moving said pair of gears into the engaged first position;

3. a train of gears adjacent said pair of gears and operably arranged to have a first position out of engagement with said pair of gears and a second position engaged with said separated pair of gears for transmitting power through the input pinion shaft to drive the auger in a second direction of rotation reverse to said first direction; and

(b) control means operably connected to said train of gears for arranging said train of gears selectively in said first and second positions, said control means having an operating connection with said lever means for effecting sliding movement of said other gear.

4,601,349

HYDRAULIC PILE DRIVER

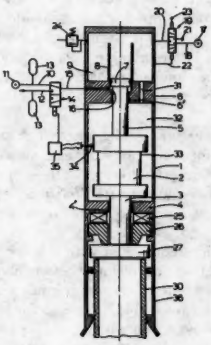
Dik Arentsen, Leiderdorp, Netherlands, assignor to IHC Holland NV, Netherlands

Filed May 24, 1983, Ser. No. 497,730

Claims priority, application Netherlands, Feb. 6, 1982, 8202224

Int. Cl.⁴ B25D *9/00*

U.S. Cl. 173—116 **5 Claims**



1. A hydraulic pile driver comprising:

a housing;

an impact weight mounted within said housing for reciprocal movement comprising a work and an idle stroke and having a circumferential groove;

a cylinder disposed within said housing and having first and second ends;

a first chamber surrounding and being in communication with said cylinder at said first end, said first chamber being pressurized with a gas from a gas source and being closed during the operation of the pile driver;

a second chamber disposed at said second end of said cylinder;

a third chamber within said housing in communication with said first chamber and sealed with respect to the atmosphere and surrounding said impact weight;

a piston disposed in said cylinder and coupled to impact weight; said piston being adapted to move toward or away from said second chamber in accordance with pressure within said second chamber, the volume of said cylinder being much smaller than the volumes of said first chamber and third chamber so that the movement of said piston does not substantially effect the gas pressure within said first chamber; said piston being constructed and arranged to move said impact weight in the work stroke as said piston moves toward said second chamber;

a pressurized liquid source adapted to provide liquid at a higher pressure than the pressure of the gas within said first chambers;

a pressurized liquid supply conduit communicating with said liquid source;

a liquid discharge conduit;

a control slide valve leading to said second chamber and coupled to said liquid supply conduit and said liquid discharge conduit;

a switch disposed in the housing and activated by by said circumferential groove for generating an electrical signal; and

electronic control means coupled to said control slide valve to selectively connect said second chamber to said liquid supply and liquid discharge conduits in response to said electrical signal;

whereby said piston moves toward said first end when said second chamber is connected to said liquid supply conduit, and toward said second end when said second chamber is connected to said discharge conduit.

4,601,350

ELECTRICALLY-OPERATED MULTI-NEEDLE CHISEL TOOL

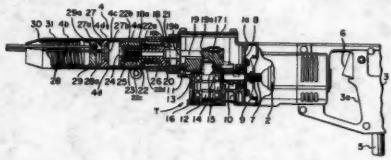
Toshio Mikiya, 9-17, Todoroki 1-chome, Setagaya-ku, Tokyo, Japan

Filed May 9, 1984, Ser. No. 608,362

Claims priority, application Japan, May 14, 1983, 58-72211[U]

Int. Cl.⁴ B21D *41/00*

U.S. Cl. 173—117 **3 Claims**



1. An electrically-operated multi-needle chisel tool comprising:

a housing having a front portion and a rear portion;

an electric motor mounted in said rear portion;

a cylinder means extending forwardly from the front portion of the housing;

a piston disposed in said cylinder means and adapted to be reciprocated by a linear motion being converted from the rotary motion of said motor;

an anvil axially slidably supported in said cylinder means and positioned forward of the piston so as to be hit by said piston;

a needle supporter axially slidably supported in said cylinder means and positioned forward of the anvil so as to be hit by said anvil;

a number of needle chisels individual supported by said needle supporter for axially slidable movement;

a return spring disposed in said cylinder means for returning the needle supporter;

said piston, said anvil and said needle supporter being adapted to be synchronously reciprocated by means of said motor;

said piston including a base portion and a reduced diameter shaft portion extending forwardly from the base portion;

a hollow generally cylindrical hammer axially slidably fitted over the fore end portion of the shaft portion of the piston in opposed relation to said anvil;

a buffer compression spring disposed around the shaft portion between the base portion of said piston and the rear end of said hammer, said buffer compression spring being arranged to begin to be compressed from the moment the hammer strikes the anvil; and

a return compression spring disposed in the bore of said hammer around the fore end portion of the shaft portion between the rear end of said bore and a flange member provided on the fore end of the shaft portion, said buffer compression spring having a greater spring constant than said return compression spring.

4,601,351

ELECTRICALLY DRIVEN HAMMER MACHINE

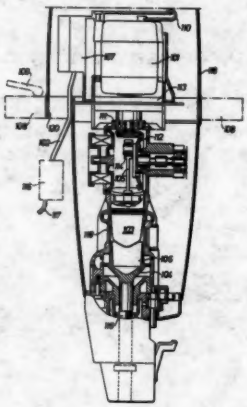
Carl S. M. Hartwig, Täby; Sven H. Johansson, Åmål, and Erik A. Ljung, Stockholm, all of Sweden, assignors to Institut CERAC S.A., Ecublens, Switzerland

Filed Sep. 14, 1983, Ser. No. 532,192

Claims priority, application Switzerland, Sep. 22, 1982, 5600/82

Int. Cl.[4] B25D *13/00*

U.S. Cl. 173—117 **3 Claims**



1. An electrically driven hammer machine comprising an electric motor having a power supply, a hammer mechanism having a driving piston, an elastic means and a hammer piston, said hammer piston being driven in a reciprocative motion by said driving piston via said elastic means, the improvement comprising:

said motor being a brushless alternating current motor,

said power supply comprising a solid state inverter for supplying said motor with power of variable amplitude and frequency,

a controller connected to said solid state inverter for controlling the amplitude and frequency of the power supplied to said motor,

an actuator for supplying a direct current signal to said controller for controlling said inverter and the amplitude and frequency of said power supplied to said motor in response to variations in said direct current signal,

said actuator comprising a plurality of magnetically actuated switches for selecting the magnitude of said direct current signal whereby the speed of said motor is controlled to reciprocate said drive piston at various speeds.

4,601,352

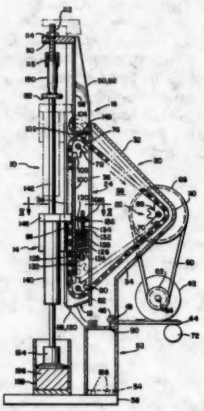
AUTOMATIC COMPACTOR

Edward R. Hamilton, Austin, Tex., assignor to Rainhart Company, Austin, Tex.

Filed Sep. 19, 1984, Ser. No. 652,045

Int. Cl.[4] B30B *9/38*

U.S. Cl. 173—124 **14 Claims**



1. An automatic compactor for compacting samples of material to be tested, said automatic compactor comprising:

a slide hammer slideable vertically along a guide rod, said guide rod being attached at a first, lower end to a compaction foot positionable on the sample to be compacted and extending generally vertically upwardly to a handle carried at a second, upper end of said guide rod;

a drive chain having a portion thereof generally parallel to said guide rod and having means to engage and raise said slide hammer along said guide rod;

a main frame assembly carrying a drive means for said drive chain;

means to release said slide hammer from said drive chain at a release point while allowing said slide hammer to continue to move vertically upwardly along said guide rod substantially without restriction until it decelerates and stops at a rest point above said release point and below said handle; and

shuttle means interconnected with said handle for maintaining a constant vertical distance between said rest point and said compaction food during compaction of the sample, said shuttle means including means for lowering the portion of said drive chain which travels generally parallel to said guide rod with respect to said main frame to lower said release point and said rest point concurrently with downward travel of said guide rod during compaction of the sample.

4,601,353

METHOD FOR DRILLING DRAINHOLES WITHIN PRODUCING ZONE

Frank J. Schuh, Plano, and John H. Striegler, Richardson, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 5, 1984, Ser. No. 658,244

Int. Cl.[4] E21B *47/00*

U.S. Cl. 175—41 **5 Claims**

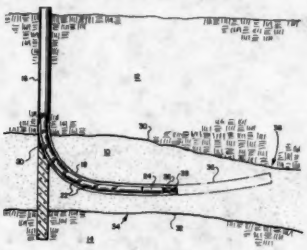
1. A method for drilling a drainhole within a preselected subsurface zone comprising:

using a directionally sensitive measurement while drilling device carried on a drainhole drill string near a drill bit to

measure at least one formation property while drilling a drainhole,

stopping drilling at such time as a change in the formation property is detected,

rotating the drill string to orient the measurement device in a plurality of known angular positions and measuring said



property in each of said positions to determine the direction from the borehole of the detected property change, and

continuing drilling of said drainhole while adjusting the angle of drilling to direct said drainhole away from the direction of the detected property change.

4,601,354

MEANS AND METHOD FOR FACILITATING MEASUREMENTS WHILE CORING

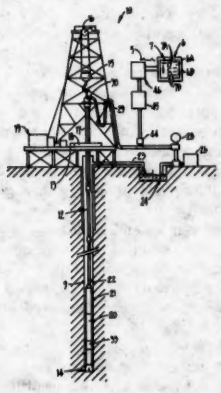
Frank L. Campbell, Santa Ana; Dean C. Barnum, Fullerton, and William C. Corea, Brea, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1984, Ser. No. 646,863

The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.

Int. Cl.⁴ E21B *47/09*

U.S. Cl. 175—46 **8 Claims**



1. Apparatus for monitoring detrimental conditions associated with extraction of a core from an earth formation penetrated by a well bore using a core barrel having a rotatable outer cylindrical barrel attached to and operationally rotated by, a drill string, and drilling fluid circulating within said well bore as said core is extracted, wherein rotation of a usually stationary inner core barrel coaxial of the outer core barrel during said extraction of said core and its placement thereof within the cylindrical inner barrel, is used to indicate said associated detrimental coring conditions, comprising;

first means mechanically attached to said core barrel and operationally fitted between said outer and inner core barrels for generating a series of signals indicative of relative rotation of the inner core barrel relative to the outer core barrel during extraction of said core from the formation;

second means uphole from said first means and operational connected thereto for responding to said series of signals indicative of said relative inner barrel rotation wherein occurrence of said relative inner barrel rotation, causes operations to be initiated to overcome any associated detrimental condition within said well bore.

4,601,355

ELECTRONIC WEIGHER

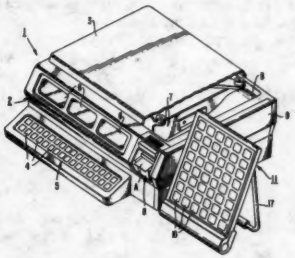
Naoki Takahashi, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Aug. 31, 1984, Ser. No. 646,089

Claims priority, application Japan, Aug. 31, 1983, 58-135761[U]

Int. Cl.⁴ G01G *23/38, 23/00*; G06F *15/20*

U.S. Cl. 177—2 **9 Claims**



1. An electronic weigher of the type in which commodity data is read out of a memory by using preset keys when a commodity is weighed, and in which at least the weight value of the weighed commodity is displayed, comprising:

a body;

a weighing platform on said body on which a commodity is placed when being weighed;

a control panel having a plurality of keys on said body;

a display section on said body for displaying at least the weight value of the weighed commodity;

a connecting shaft attached to said body; and

a separate keyboard having a plurality of preset keys and attached to said body via said connecting shaft, said keyboard being detachable from said body.

4,601,356

SUSPENDED PLATFORM SCALE STRUCTURE

Vincent J. Muccillo, Jr., 952 La Jolla Rancho Rd., La Jolla, Calif. 92037

Filed Feb. 1, 1985, Ser. No. 697,240

Int. Cl.⁴ G01G *3/14, 19/52, 21/28, 21/12*

U.S. Cl. 177—211 **9 Claims**

1. A low profile platform scale comprising:

a base frame of a generally rectangular configuration defined by a peripheral inwardly opening channel;

a plurality of load cells mounted on said base frame;

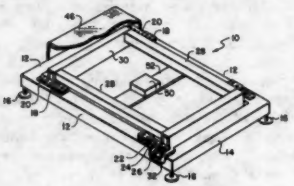
a support arm secured to each of said load cells;

load support platform means comprising a generally rectangular support frame disposed within the perimeter of and at least partially below said base frame;

suspension means comprising a plurality of suspension arms extending outward from said support frame into the chan-

nel of said base frame, and flexible means connecting said arms to said load cells;

said load cells each includes a selectable load arm; and



said flexible means is connected between said arms on said platform support frame and said selectable load arms.

4,601,357

FOUR-WHEEL STEERING SYSTEM FOR VEHICLE

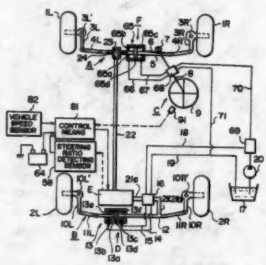
Akihiko Miyoshi; Shigeki Furutani, both of Hiroshima; Isamu Chikuma, and Satoru Shimada, both of Gumma, all of Japan, assignors to Mazada Motor Corp., Hiroshima and Nippon Seiko Kaisha, Tokyo, both of, Japan

Filed Mar. 21, 1985, Ser. No. 714,530

Claims priority, application Japan, Mar. 26, 1984, 59-56180

Int. Cl.[4] B62D *5/00*

U.S. Cl. 180—140 **17 Claims**



1. A four-wheel steering system for a vehicle comprising a steering mechanism including a steering wheel, a front wheel turning mechanism operatively connected to the steering mechanism to turn the front wheels according to the turning angle of the steering wheel, a rear wheel turning mechanism operatively connected to the steering mechanism to turn the rear wheels in response to operation of the steering wheel, a vehicle speed sensor for detecting the vehicle speed and outputting a vehicle speed signal, a rear wheel steering ratio changing means for changing the ratio of the turning angle of the rear wheels to the turning angle of the steering wheel according to a control signal input thereinto, and a control signal generating means which receives the vehicle speed signal from the vehicle speed sensor and inputs said control signal into the rear wheel steering ratio changing means to change the ratio of the turning angle of the rear wheels to the turning angle of the steering wheel according to the vehicle speed, characterized by having a steering wheel turning angle sensor which detects the turning angle of the steering wheel and outputs a steering wheel turning angle signal, and an inhibiting means which receives the steering wheel turning angle signal and inhibits the rear wheel steering ratio changing means from changing the ratio of the turning angle of the rear wheels to the turning angle of the steering wheel when the steering wheel is turned right or left from its neutral position.

4,601,358

POWER STEERING SYSTEM

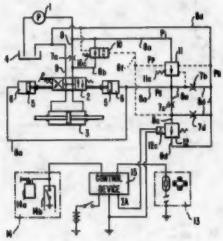
Hajime Kozuka, and Hiroshi Yoshida, both of Okazaki, Japan, assignors to Mitsubishi Jidoshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 560,991

Claims priority, application Japan, Dec. 20, 1982, 57-222098

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—141 **5 Claims**



1. A power steering system comprising:

an input shaft;

a steering wheel connected to said input shaft;

a torsion bar connected to said input shaft for transmitting the rotation of said input shaft;

an output shaft connected to said torsion bar to which the rotation of said input shaft is transmitted;

a fluid passage changeover valve connected to said input shaft for switching fluid flow between fluid flow passages in accordance with the difference between the angle of rotation of said input and output shafts;

rack and pinion means driven by said output shaft;

a power cylinder having a piston connected to said rack;

an oil pump;

a high pressure fluid passage connected between said oil pump and said power cylinder and having said changeover valve connected therein for delivering hydraulic fluid from said oil pump to said power cylinder;

an oil reservoir;

a first low pressure fluid passage connected between said power cylinder and said reservoir and in which said changeover valve is connected for returning hydraulic fluid from said power cylinder to said reservoir;

a reaction piston means engaging one of said input and output shafts for producing a force on the thus engaged shaft for restricting said difference in angle of rotation between said shafts;

a branch fluid passage extending from said high pressure fluid passage to said reaction piston means;

a pressure control valve in said branch fluid passage for maintaining the hydraulic pressure in said branch fluid passage at a level not exceeding a predetermined maximum pressure;

a second low pressure fluid passage having one end connected to said branch fluid passage downstream of said pressure control valve and having an orifice therein, the other end of said second low pressure fluid passage being connected to said reservoir;

a pilot pressure control valve in said second low pressure fluid passage downstream of said orifice for controlling a pilot pressure; and

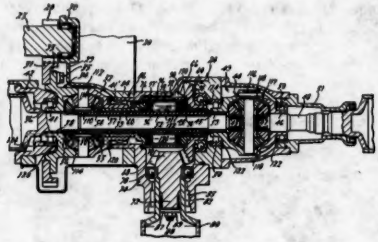
a pilot fluid passage connected between said second low pressure fluid passage and said pressure control valve for transmitting said pilot pressure to said pressure control valve.

4,601,359

PART TIME ON-DEMAND FOUR-WHEEL DRIVE VEHICLE TRANSAXLE WITH VISCOUS CLUTCH

Peter H. Weismann, Santa Ana, Calif.; Dugald Cameron, Grosse Pointe Woods, Mich., and Richard E. Eastman, Central Square, N.Y., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 10, 1985, Ser. No. 743,215
Int. Cl.[4] B60K 17/02
U.S. Cl. 180—233 1 Claim



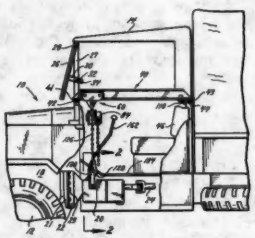
1. A dual differential part time on-demand four-wheel drive assembly adapted for a two-wheel drive front transaxle having an internal combustion engine with a transverse oriented crankshaft for driving a vehicle with front and rear pairs of road wheels, a transmission gear unit for said transaxle including transverse input and output shafts, and right and left laterally extending front axle drive shafts, each said drive shaft having front wheel mounting means on its outboard end mounting said front pair of road wheels, said dual differential assembly comprising; housing means having a laterally extending passage therethrough aligned on a transverse axis, said housing means having first and second differential casings for associated first and second bevel gear differentials, said casings supported in laterally spaced alignment for rotation about said transverse axis, each said first and second differential casing enclosing inboard and outboard side gears in meshing relation with a plurality of planetary pinion gears, each said casing having opposed inboard and outboard axial extensions thereon, each casing extension formed with a through bore aligned on said transverse axis, input gear means on said first casing engaging gear means on said transmission output shaft, first and second side gear shafts aligned on said transverse axis, said first side gear shaft inboard end extending through the bores of said first casing extensions and said second casing inboard extension end connected to said second differential inboard side gear for rotation therewith, said second side gear shaft inboard end extending through said second casing outboard extension bore and connected to said second differential outboard side gear for rotation therewith, an inner constant diameter sleeve concentric about said first side gear shaft having its one end connected to said first differential outboard side gear for rotation therewith and its other end fixed to said second casing for rotation therewith, an outer sleeve concentric about said inner sleeve and having one end connected to said first casing for rotation therewith, said outer sleeve having a longitudinally disposed driving crown gear fixed to its other end for rotation therewith, said crown gear having oppositely facing sides with the side facing said first differential having an outer rim of beveled teeth defining a central annular pocket, a longitudinally extending propeller shaft having a drive cone gear fixed to its forward end, said cone gear having beveled teeth in direct meshing engagement with said driving crown gear beveled teeth, said propeller shaft having its aft end drivingly engaged with a third rear wheel differential, rear axle means interconnecting said pair of rear road wheels to said rear wheel differential, the improvement wherein single viscous fluid clutch means adapted to provide automatic torque transfer between said inner sleeve and said outer sleeve, said clutch means in the form of a concentric outwardly spaced cylindrical drum portion connected between transversely spaced constant diameter sections of said outer sleeve by a pair of radially extending drum end walls, said cylindrical drum portion and said pair of end walls defining a viscous fluid chamber with a portion of said inner sleeve, one of said drum end walls being nested within said crown gear pocket in a compact concentric manner, said cylindrical drum portion having its inner surface formed with internal splines and said inner sleeve portion formed with corresponding external splines, a first set of ring-shaped viscous coupling plates in said chamber having internal splines drivingly connected to said inner sleeve portion external splines, a second set of ring-shaped viscous coupling plates interleaved with said first set of plates having external splines drivingly connected to said cylindrical drum portion internal splines, viscous fluid in said chamber adapted to be sheared in a progressively increasing manner by said plates as the speed difference between said first differential side gears increases as a result of the friction between the road and one pair of road wheels is substantially less than the friction between the road and the remaining pair of road wheels, thereby splitting the inner and outer sleeves transfer torque in a part time on-demand automatic manner governed by the difference in road friction between the front and rear road wheels.

4,601,360

BEAM AND CHAIN HOIST FOR REMOVING VEHICLE TRANSMISSION

Steven D. Duke, 1371 Andrew Dr., Glendale, Mo. 63122

Filed Jul. 27, 1984, Ser. No. 635,148
Int. Cl.[4] B60K 5/10; B66C 7/08
U.S. Cl. 180—294 8 Claims



1. Apparatus for removing a transmission from a vehicle for repairs comprising:

(a) longitudinally spaced first and second support means on the vehicle;

(b) an elongate support beam having longitudinally spaced first and second end support means carried by corresponding support means on the vehicle, said beam having a lower flange providing a carriage support surface at substantially the same elevation as the corresponding support means,

(c) a carriage having a plurality of wheels movable on said carriage support surface,

(d) a hoist connected to said carriage below said beam and movable with said carriage, said hoist including connection means removably connectible to the transmission for moving said transmission vertically and longitudinally, and

(e) the vehicle including a windshield post and the first vehicle support means being disposed on opposite sides of said post, and

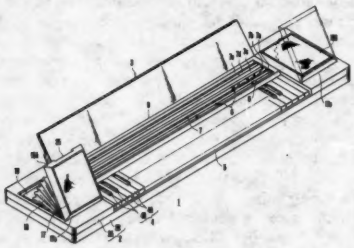
(f) the beam including a bifurcated portion to provide a post-straddling first support means to limit sideways movement of the beam.

4,601,361

STRUCTURE FOR MOUNTING LOUDSPEAKER ON ELECTRONIC MUSICAL INSTRUMENT

Akira Nakada, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,178
Claims priority, application Japan, Jan. 26, 1984, 59-8252[U]
Int. Cl.[4] H05K *5/00*; G10H *1/00*
U.S. Cl. 181—141 8 Claims



1. A compactable and adjustable structure for mounting a speaker in an electronic musical instrument having a speaker accommodating space comprising:

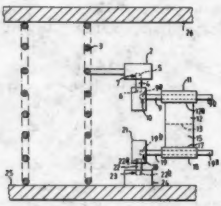
a bellows shaped hollow pliable member with first and second ends, said first end being adapted to allow mounting to a speaker, said second end being adapted to allow mounting to a surface, said hollow pliable member facilitating movement from a first position, in which said speaker and said hollow pliable member is wholly confined within said speaker accommodating space, to a plurality of second positions in which said speaker and said hollow pliable member project at least partially beyond the confines of said speaker accommodating space, movement from said first position to said plurality of second positions allowing adjustment of the volume of air behind the speaker and within the hollow pliable member to obtain an optimum acoustic characteristic.

4,601,362

DEVICE FOR DAMPING AN OSCILLATORY SYSTEM

John P. Wren, Chiseldon, England, assignor to Garrard Products Limited, Hamilton, Bermuda

Filed May 8, 1984, Ser. No. 608,210
Claims priority, application United Kingdom, May 19, 1983, 8313864
Int. Cl.[4] F16F *15/00*
U.S. Cl. 181—208 9 Claims



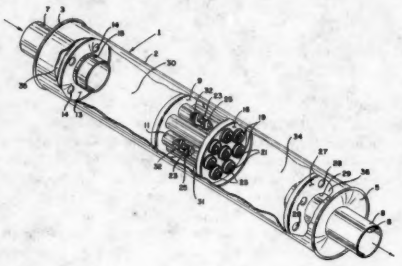
1. A device for damping vibrations of an oscillatory system mounted on a surface, comprising: a first connection member for connection to part of said oscillatory system; a second connection member for connection to said surface on which said oscillatory system is mounted; and a plurality of bearing means connected between said first connection member and said second connection member, said plurality of bearing means comprising a first bearing means having a first and a second bearing members responsive to vibrations in respective planes not parallel to one another and a second bearing means having a third and a fourth bearing elements responsive to vibrations in respective planes not parallel to one another, the first bearing means being connected to the second bearing means by a joining member.

4,601,363

LARGE DIESEL ENGINE EXHAUST MUFFLER

Theodore R. Harris, 14 El Patio, Orinda, Calif. 94563, and Richard T. Harris, 3127 Stanley Blvd., Lafayette, Calif. 94549

Filed Nov. 6, 1984, Ser. No. 668,660
The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.
Int. Cl.[4] F01N *1/12*
U.S. Cl. 181—280 9 Claims



1. An internal combustion engine muffler comprising:

a. an elongated housing having a curvilinear side wall, an inlet end wall formed with a first inlet opening, and an outlet end wall formed with a first outlet opening;

b. an inlet tube connected to said inlet end wall and communicating with said first inlet opening in said inlet end wall;

c. an outlet tube communicating with said first outlet opening in said outlet end wall;

d. a first internal relection wall axially spaced downstream from said inlet end wall forming a close fit with said curvilinear side wall and formed with a plurality of large tube openings;

e. a second internal reflection wall spaced between said inlet end wall and said first internal reflection wall forming a close fit with said curvilinear side wall and formed with a first edge echo orifice opening therethrough and a second inlet tube opening;

f. said inlet tube communicates with said second inlet tube opening in said second internal reflection wall;

g. a bulkhead wall axially spaced downstream from said first internal reflection wall forming a close fit with said curvilinear side wall and formed with a plurality of large tube openings axially aligned with said large tube openings in said first internal reflection wall;

h. at least three elongated internal large tube members extending from said internal reflection wall to said bulkhead wall and communicating with said large tube openings in said first internal reflection wall and said bulkhead;

i. inner small tube members coaxially mounted within each of said large tubes forming open ended pulse chambers;

j. helical members joining each of said inner small tubes and said large tube members;

k. a third internal reflection wall axially spaced downstream from said bulkhead wall forming a close fit with said curvilinear side wall and formed with a second edge echo orifice opening therethrough and a second outlet tube opening formed in alignment with said first outlet opening in said outet end wall;

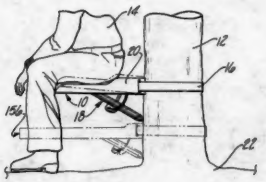
l. said outlet tube is in communication with said second outlet tube opening in said third internal reflection wall;
m. a primary expansion chamber formed by said curvilinear side wall, said second internal reflection wall and said first internal reflection wall;
n. elongated swirl and pulse smoothing chambers formed between said small tubes and said internal large tubes and divided by said helical members;
o. a primary interference chamber formed by said curvilinear side wall, said bulkhead wall and said third internal reflection wall;
p. a first acceleration gas expansion chamber formed by said curvilinear side wall, said inlet end wall, and said second internal reflection wall;
q. a second acceleration gas expansion chamber formed by said curvilinear side wall, said third internal reflection wall and said outlet end wall;
r. said length of said primary expansion chamber and the length of said primary interference chamber are substantially greater than the length of said elongated internal large tube and inner small tube members; and
s. said internal large tube and inner small tube member are positioned at substantially the mid-point of said housing.

4,601,364

HUNTING SEAT

James A. York, 25450 Ryan Rd., Warren, Mich. 48091

Filed May 25, 1984, Ser. No. 614,030
Int. Cl.[4] A01M *31/02;* A45F *3/26;* A47C *9/10*
U.S. Cl. 182—187 20 Claims



1. A portable seat adapted to be mounted to a vertical post comprising:
a platform having a concave rear edge, and means for detachably securing said platform to the vertical post at said rear edge so that said platform extends substantially horizontally outward from said post, said means comprising:
a flexible strap substantially longer than the circumference of the post, means for securing said strap to said platform, and coupling means for coupling said strap in tight circumferential engagement with the post,
a support leg, and means for pivotally securing one end of said support leg to the bottom of said platform, including guidance means for adjustably inclining said leg toward rear edge of said platform so that the other end of said leg is positioned for engagement with said post below said seat; and
wherein said means for securing said strap to said seat comprises channel means formed in said platform adjacent said rear edge for forming a hollow channel adapted to receive said strap.

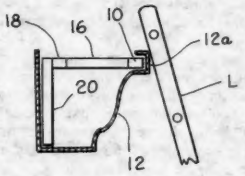
4,601,365

RAIN GUTTER LADDER SUPPORT

Curtis E. Davis, 1462 E. Tamassee Dr., Seneca, S.C. 29678

Filed Jun. 10, 1985, Ser. No. 742,972
Int. Cl.[4] E04D *13/04;* E06C *7/48;* E04G *21/24*
U.S. Cl. 182—230 4 Claims

1. A rain gutter ladder support device comprising a front support bar for engaging a front edge of said gutter; horizontal arm means for bracing said front support bar between said front edge of said gutter and a rear wall of said gutter; vertical leg means for resting against a rear bottom portion of said gutter and supporting said horizontal arm means above said bottom of said gutter in a manner that said front support bar is



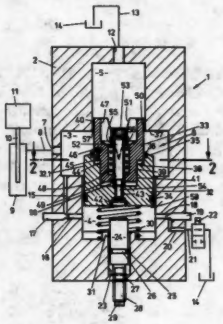
braced against said front edge of said gutter to stabilize and fully support the weight of a ladder and person on the ladder leaning against said front edge of said gutter.

4,601,366

DOWN VALVE FOR THE DOWN SPEED CONTROL OF A HYDRAULIC ELEVATOR

Roy W. Blain, Pfaffenstrasse 1, D-7100 Heilbronn, Fed. Rep. of Germany

Filed Apr. 17, 1984, Ser. No. 600,582
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3314657
Int. Cl.[4] F15B *13/042*
U.S. Cl. 187—17 7 Claims



1. A down valve for controlling the downward speed of a hydraulic elevator, comprising
(a) a housing (1) containing a pressure chamber (3), and longitudinally-arranged cylindrical reverse pressure (4) and return chambers (5) contained in opposite end walls of said pressure chamber, respectively, said housing including an inlet (7) for connecting said pressure chamber with a hydraulic elevator cylinder (9), and first (20) and second (12) outlets for connecting said reverse pressure and return chambers with a sump (14), respectively;
(b) a sealing spool (32) slidably mounted in said reverse pressure chamber, said sealing spool containing in the end thereof adjacent said return chamber an end bore (38) and an inner counterbore (39);
(c) first spring means (30) biasing said sealing spool toward a closed position in sealed engagement with the one pressure chamber end wall (37) that contains said return chamber, thereby to isolate said pressure chamber from said return chamber;
(d) a stepped metering spool (33) having at one end first (40) and second (42) portions slidably mounted in said sealing spool end bore and counterbore, respectively, said metering spool having at its other end an annular portion (50)

that extends within said return chamber, said annular portion containing adjacent its free extremity means defining at least one longitudinally extending return metering passage (51) the effective size of which progressively decreases in the direction away from said return chamber;

(e) second spring means (56) biasing said metering spool away from said sealing spool in the direction of said return chamber;

(f) by-pass passage means (15,16) connecting said pressure chamber with said reverse pressure chamber, said sealing spool being in its closed position relative to said pressure chamber one end wall when said first outlet is closed, said sealing spool being displaced, when said first outlet is opened, by the pressure of fluid in said pressure chamber toward an open position relative to said one pressure chamber end wall; and

(g) positioning passage means (45,45.1) including a pressure sensing orifice (46,46.1) contained in one of said sealing and metering spools for connecting said pressure chamber with the positioning chamber (44) defined between the end wall of said sealing spool end bore and the adjacent annular end surface of said first stepped portion of said metering spool, and vent passage means (49, 55) connecting with said return chamber the back chamber (59) defined between the end wall of said sealing spool counterbore and the adjacent end surface of said metering spool second portion, whereby the pressure fluid supplied to said positioning chamber via said pressure sensing orifice displaces said metering spool relative to said sealing spool toward a pressure-responsive metering position with respect to said pressure chamber one end wall surface, thereby to effect load-compensated down speed of the elevator.

4,601,367

CRASH PROTECTION STRUCTURAL COMPONENT

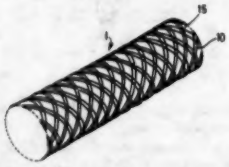
Bernd Bongers, Kirchheim, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 328,146, Dec. 7, 1981, abandoned. This application Jan. 10, 1985, Ser. No. 690,811

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049425

Int. Cl.[4] F16F 7/12

U.S. Cl. 188—376 10 Claims



1. The new use of a crash protection structure, comprising a hollow body having a longitudinal central axis and including an open netting made of at least one fiber compound material strand having fibers embedded in a resin matrix material forming said hollow body having ends movable relative to each other in the direction of said central axis, said strands extending at an angle (α) relative to said longitudinal axis of said structure, said angle (α) being within the range of $\pm 30°$ to $\pm 60°$, said open netting having a plurality of strand crossing junctions (15), each strand crossing junction comprising a plurality of overlapping strand layers laminated and bonded to each other by resin matrix material in its cured state to form a rigid connection at each of said strand crossing junctions, said laminated strand layers forming interfaces between adjacent strand layers in said strand crossing junctions and taking up stress under shear, said fiber compound material strand having a width (d), said strand crossing junctions being spaced from each other by an on-center spacing (e) which is larger than said width (d) so that openings are formed in said open netting and so that strand portions between the crossing junctions form bending rods for transmitting shearing stress into said crossing junctions, as a crash protection device for taking up a stress first in an elastic manner and then in a manner irreversibly dissipating a crash force applied substantially in the direction of said longitudinal axis and moving said ends relative to each other in a substantially axial direction of said crash protection device, whereby a crash force is taken up initially in an elastic, reversible manner primarily by said bending rods, which force is then transmitted by said bending rods into said strand crossing junctions for an irreversible dissipation by the delamination of the strands in the bending rods and in the strand crossing junctions, whereby large crash force-peaks are effectively damped.

4,601,368

INFINITELY VARIABLE RATIO TRANSMISSION

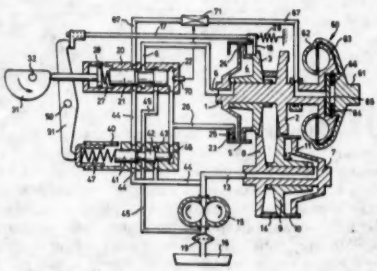
Petrus H. van Deursen, Deurne, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Aug. 25, 1982, Ser. No. 411,571

Claims priority, application Netherlands, Aug. 28, 1981, 8104001

Int. Cl.[4] F16D 33/00; F16H 7/02

U.S. Cl. 192—3.3 4 Claims



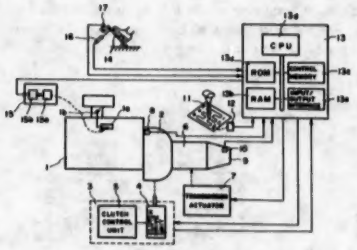
1. A transmission comprising a hydrodynamic transmission unit connected to the input shaft of a variable ratio V-belt transmission unit, the hydrodynamic transmission unit including a hydrodynamically actuated lock-up means operative to lock the hydrodynamic transmission unit in a direct-driver mode, the V-belt transmission having a fluid pressure cylinder which controls the axial position of a conical pulley disc forming part of the V-belt transmission to control the ratio of input to output, a hydraulic control valve for the control of the flow of fluid from a pump to and from said fluid pressure cylinder, the hydraulic control valve comprising a housing having a reciprocable internal valve spool which can be displaced from an end position in which the valve spool rests against a stop to a second position thereby closing ports of fluid lines leading to the fluid pressure cylinder, the hydrodynamically actuated lock-up means being directly connected to the fluid pump by a fluid duct including a second valve means operated by a control means responsive to the position of the valve spool such that only slight movement of the valve spool actuates the lock-up means before any change in the ratio of the transmission takes place.

4,601,369

VEHICLE ELECTRONIC CONTROL METHOD

Toshihiro Hattori, Ayase, and Masaki Ishihara, Fujisawa, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,324
Claims priority, application Japan, Dec. 28, 1982, 57-230310
Int. Cl.[4] B60K *41/22*
U.S. Cl. 192—3.58 4 Claims



1. A method of electronically controlling a vehicle having a clutch controlled by a clutch actuator, a transmission for changing gear ratios by a transmission actuator and having a synchromesh mechanism provided at gear positions other than a reverse gear position, and an electronic control unit for controlling both actuators in accordance with the vehicle running conditions, said method comprising steps of:

(a) disengaging the clutch in response to a command delivered to the clutch actuator by the electronic control unit at the same time that the transmission starts to be switched to the reverse gear position;

(b) switching the transmission to a neutral gear position in response to a command delivered to the transmission actuator by the electronic control unit after the clutch is disengaged;

(c) switching the transmission to a gear position provided with the synchromesh mechanism in response to a command delivered to the transmission actuator by the electronic control unit with the clutch remaining in the disengaged state; and

(d) switching the transmission to the reverse gear position in response to a command delivered to the transmission actuator by the electronic control unit with the clutch remaining in the disengaged state.

4,601,370

DRIVE RELEASE BRAKE ASSEMBLY

George E. Papadopoulos, Rua Visonte De Piraza 284 Apt. 701, Ipanama, Rio De Janeiro, Brazil

Filed Jun. 7, 1982, Ser. No. 385,475
Int. Cl.[4] B60K *41/20*
U.S. Cl. 192—8 R 22 Claims

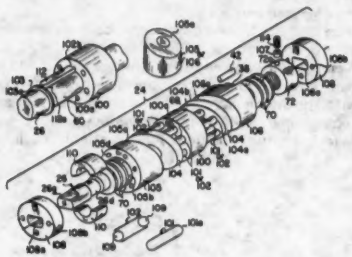
1. A drive release brake assembly comprising:

axial core means;

wedge means carried by said axial core means and including a plurality of axially extending bores, said wedge means being fixed against rotation relative to said core means;

cam means defining a pair of substantially identical cam surfaces axially carried on either side of said wedge means, said cam surfaces having substantially planar surfaces and being rotatably relative to said core means and to one another;

means for rotating said cam surfaces between a first angularly aligned position where the axial distance between the facing cam surfaces is substantially equal in all angular positions and a second position out of angular alignment, said axial distance in said aligned first position being greater than the axial length of said wedge means to permit relative rotation between said cam surfaces and said core means, said axial distance in said second unaligned position being less than the axial length of said wedge



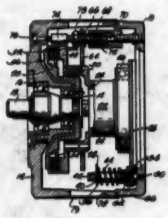
means to wedge said wedge means between said cam surfaces to prevent the rotation of said cam surfaces relative to said core means.

4,601,371

ALTERNATING CURRENT CLUTCH

Wayne D. Hendricks, Mukwonago, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Jun. 2, 1983, Ser. No. 500,375
Int. Cl.[4] F16D *11/00*
U.S. Cl. 192—52 27 Claims



18. A friction drive comprising an input member and an output member having friction drive surfaces therebetween, one of said input and output elements being axially movable relative to the other of said input and output elements, a non-rotating loading plate, spring means for exerting a spring force on said loading plate, means for adjusting the force exerted by said spring means on said loading plate, and means for selectively connecting said loading plate to one of said input and output members to transfer the spring force from said loading plate to said one of said input and output members to bias said input and output members toward each other such that said friction drive surfaces engage each other, said connecting means including means for selectively and alternatively disconnecting said loading plate from said one of said input and output members to remove the spring force from said one of said input and output members.

4,601,372

AUTOMATICALLY ENGAGEABLE AND DISENGAGEABLE DRIVE COUPLER MECHANISM

Barton L. Swales, and Richard L. Boens, both of Coal Valley, Ill., assignors to Deere & Company, Moline, Ill.

Filed Oct. 31, 1983, Ser. No. 546,832
Int. Cl.[4] F16D *11/06, 3/48*
U.S. Cl. 192—67 R 11 Claims

1. A disengageable driving arrangement comprising the combination of:

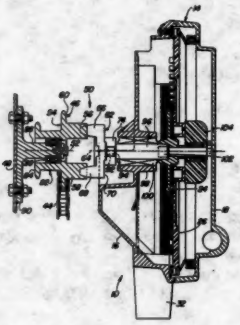
a drive member rotatable about an axis of rotation;

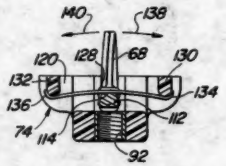
a drive coupler coupled to the drive member and having a pair of drive lugs, the drive lugs being of narrow, elongated configuration and extending outwardly from the drive coupler on opposite sides of the axis of rotation of the drive member;

a driven member disposed adjacent the drive member and rotatable about an axis of rotation;

a driven coupler coupled to the driven member and having a pair of driven lugs on opposite sides of the axis of rotation of the driven member, the pair of driven lugs adapted to be engaged by the pair of drive lugs;

means for permitting rotation of the pair of driven lugs about





an axis extending in a different direction from the axis of rotation of the driven member;

the pair of driven lugs being mounted on opposite ends of an intermediate member extending therebetween so as to move together with the intermediate member as a single element; and

means for resiliently biasing the pair of driven lugs into a neutral position in which the driven lugs are generally parallel to the axis of rotation of the driven member, the pair of driven lugs and the included intermediate member being rotatable in opposite directions from the neutral position against resilient resistance of the means for resiliently biasing.

4,601,373

CLUTCH WITH BUILT-IN TRAVEL LIMITING MEANS

Dominique Després, Clichy, and Jacques Feigler, Pierrefitte, both of France, assignors to Valeo, Paris, France

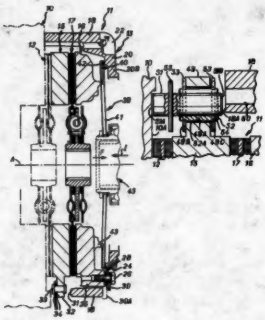
Filed Feb. 3, 1984, Ser. No. 576,895

Claims priority, application France, Feb. 8, 1983, 8301935

Int. Cl.[4] F16D *13/44, 13/75*

U.S. Cl. 192—70.18 **21 Claims**

1. A clutch with built-in travel limiting means, comprising, axially distributed along a common rotation axis, a reaction plate, at least one pair of members comprising in succession a friction disk and a pressure plate, an annular cover adapted to be mounted on said reaction plate and forming therewith a cover-reaction plate assembly, engagement means adapted to urge said pressure plate continually towards said reaction plate, disengagement means adapted to urge said pressure plate continually towards said cover, at least one radial lug formed with an axial bore on the periphery of said pressure plate, a respective rigid peg adapted to serve as travel limiting means passing through said at least one axial bore and axially movable therein, two bearing surfaces on said cover-reaction plate assembly, in axial face-to-face relationship and constituting stop members between which said peg is axially movable, a friction bush within which said peg is adapted to slide with friction, at least one clamping member adapted to press said bush against said peg, said bush being axially moveable within said bore and axial retaining members on said bush adapted to



retain it extending through said axial bore, wherein said at least one clamping member separate from said bush is selected so that said peg can slide within said bush when a force of preselected valve is applied to said pin in either direction, said force value being one wherein said peg will slide within said bush when acted on by said engagement means but will not slide when acted on by said disengagement means the force applied by said engagement means being greater than said force value and the force applied by said disengagement means being less than said force value, and wherein said plates and said cover are adapted to be constrained to rotate with a driving shaft and said disk is adapted to be constrained to rotate with a driven shaft.

4,601,374

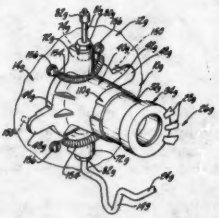
HYDRAULIC CLUTCH PISTON AND SEAL

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 370,710, Apr. 22, 1982. This application Jan. 19, 1983, Ser. No. 459,184

Int. Cl.[4] F16D *25/08, 23/14*

U.S. Cl. 192—85 CA **1 Claim**



1. In a system for actuating a clutch by axial movement of an actuating member rotatable about a clutch axis via engagement with a clutch release bearing, the improvement comprising a fluid actuated clutch release bearing assembly having a central

axis and being adapted to be supported with said central axis generally in line with the clutch axis, said clutch release bearing assembly including a housing member having an annular, axially extending cylinder portion having a cylinder cavity, a generally tubular piston adapted to be received in said cylinder cavity for reciprocation therein generally along said central axis in response to fluid pressure from a fluid line to said cylinder cavity, said piston having a support ring portion adapted to supportingly receive the clutch release bearing for reciprocable movement with said piston, said fluid line including a resilient trap portion located proximate to said bearing assembly for collecting solid particles to inhibit the same from entering said cylinder cavity, alignment means separate from the clutch release bearing and defining a radial clearance for permitting a preselected radial movement of at least a part of said clutch release bearing assembly in response to engagement of the clutch release bearing with the clutch actuating member whereby the axis of rotation of the clutch release bearing can be substantially moved into alignment with the clutch axis, said resilient trap portion as located proximate to said bearing assembly flexibly permitting at least some of said preselected radial movement.

4,601,375

CLUTCH APPARATUS FOR VEHICLES

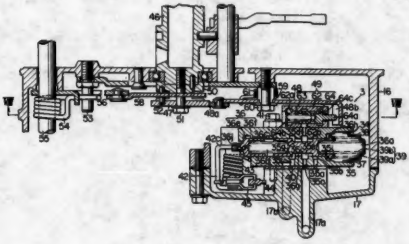
Tsutomu Hayashi, Hoya, and Kouhei Ohzono, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1983, Ser. No. 511,283

Claims priority, application Japan, Jul. 6, 1982, 57-117467; Jul. 10, 1982, 57-120135

Int. Cl.⁴ F16D *25/061*

U.S. Cl. 192—85 AA **5 Claims**



1. A clutch apparatus for vehicles, said clutch apparatus having first friction plates in engagement with an outer case, second friction plates in engagement with a clutch hub penetrating through the center of said first friction plates, and a piston slidable within said outer case for pressing said friction plates into engagement with each other, so that rotation from an engine side rotary shaft coupled to the outer case side is transmitted to a transmission side rotary shaft coupled to the clutch hub side; an oil pump for supplying hydraulic oil pressure to said piston for engaging said friction plates with each other; and a directional control valve interposed in the flow path leading from said oil pump to said clutch unit, the improvement wherein said directional control valve comprises: a housing having an inlet port leading to the oil pump, a supply port connected to the clutch unit, and an open port in communication with an open end; a regulator piston slidably fitted in said housing for movement into a first position at which said inlet port is communicated with said supply port and a second position at which said supply port is communicated with said open port; a control piston slidably fitted in said housing on substantially the same axis as the axis of said regulator piston, said control piston being in interlocked relation to a clutch lever through a clutch wire; a first resilient member interposed between said control piston and said regulator piston for allowing relative axial movements between said pistons; a second resilient member disposed in said housing for biasing said regulator piston toward said first position and against a resilient force of the first resilient member; said regulator piston having a connecting hole for introducing a part of the hydraulic pressure fed through the inlet port to one end face of said regulator piston to bias said regulator piston toward said second position.

4,601,376

FRICTION CLUTCH

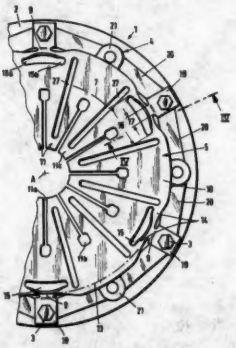
Wolfgang Reik, Bühl/Baden, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl/Baden, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,383

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241709

Int. Cl.⁴ F16D *13/44*

U.S. Cl. 192—89 B **19 Claims**



1. For attachment to a rotary torque-transmitting element, such as a flywheel, a pull-type friction clutch, comprising a diaphragm spring having an annular main section constituting or forming part of a first conical frustum, alternating tongues and slots extending inwardly from said main section, prongs extending outwardly from said main section and arranged to be secured to the torque-transmitting element, said prongs constituting or forming part of a second conical frustum, openings disposed between the slots and the prongs, as considered in the radial direction of the spring, and intermediate portions disposed in the region of said openings and constituting torsion zones between said conical frusta to facilitate changes of the conicity of said first conical frustum with reference to the conicity of said second conical frustum; a pressure plate movable axially of the torque-transmitting element under or against the bias of said spring when said prongs are secured to the torque-transmitting element; and a clutch disc adjacent to said pressure plate and arranged to be biased by the latter when the prongs of said spring are secured to the torque-transmitting element and said pressure plate is biased by said spring, said spring having a portion disposed inwardly of said prongs and arranged to bias said pressure plate toward said clutch disc.

4,601,377

CLUTCH ADJUSTMENT METHOD

Richard A. Flotow, and Roger Z. Roth, both of Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Oct. 23, 1981, Ser. No. 314,269

Int. Cl.⁴ F16D *13/75*

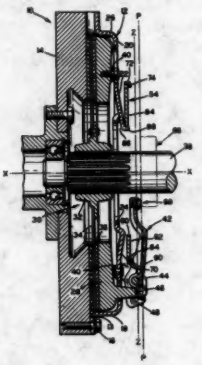
U.S. Cl. 192—110 R **3 Claims**

1. A method of adjusting a friction clutch, said clutch including a cover, a plurality of radially extending levers axially moveable relative to said cover, each of said levers having an

inner nose portion defining an axially extending extremity, and engageable with a clutch throwout bearing; said clutch further including a pressure plate axially adjacent said cover, and pressure means for axially biasing said pressure plate away from said cover; said method comprising the steps of:

(a) effecting relative axial movement of said pressure plate toward said clutch cover against bias of said pressure means, wherein said axially extending extremity of each of said inner nose portions lies within a pre-determined axial range relative to a first radially extending plane,

(b) measuring the distance between said axially extending extremity of each of said inner nose portions and said plane,



(c) providing a plurality of bosses having varying lengths corresponding to said pre-determined axial range, wherein each of said lengths is identifiable without actual measurement,

(d) selecting, from among said plurality of bosses, a boss corresponding to each of said inner nose measurements, and

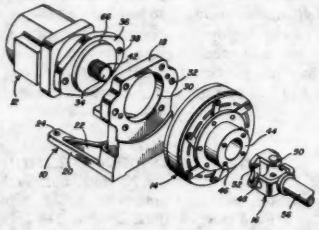
(e) affixing said selected bosses to each of said inner nose portions of said plurality of levers, whereby an axially extending extremity of each of said bosses then lies within a common plane parallel to said first plane.

4,601,378

SUPPORTING BRACKET FOR HYDRAULIC PUMP AND CLUTCH

William C. Pierce, Carollton, and Jack E. West, Dallas, both of Tex., assignors to Pitts Industries, Inc., Carollton, Tex.

Filed Nov. 3, 1983, Ser. No. 548,314
Int. Cl.[4] F16D *13/68*
U.S. Cl. 192—115 **6 Claims**



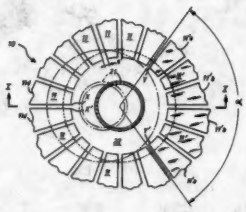
1. A supporting bracket combined with a clutch and pump, said supporting bracket including a rigidly supported plate having means engaging a portion of the pump and a portion of the clutch to maintain the pump and clutch in aligned relation, means separably securing the clutch to the plate, means securing the pump to the plate to enable removal of the pump, said clutch including means connected with a power input, said bracket, pump and clutch including coacting means transmitting rotational torque from the power input to the pump without transferring radial or axial forces to a pump shaft, said clutch being an electromagnetic clutch, said pump being a hydraulic pump for supplying pressurized fluid, said means securing the clutch to the plate including apertures in the plate and stationary component of the clutch with fastener bolts extending therethrough, said means securing the pump to the plate including a flange on the pump with apertures therein matching with apertures in the plate for receiving fastening bolts, said fastening bolts securing the pump flange of the plate also extending into the clutch, said bolts securing the clutch to the plate including bolts accessible independently of the bolts securing the pump to the plate and clutch thereby enabling selective removal of the components.

4,601,379

FRICTION CLUTCH

Pierre Renaud, Le Plessis-Trevise, and Philippe Lassiaz, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Aug. 5, 1983, Ser. No. 520,709
Claims priority, application France, Aug. 6, 1982, 82 13794
Int. Cl.[4] F16D *13/44*
U.S. Cl. 192—89 B **16 Claims**



1. A diaphragm clutch and release bearing assembly comprising a clutch cover unit including a diaphragm spring having a plurality of centripetal radial fingers separated by slots, and a central hole radially inwardly of said fingers, and a pull-type release bearing comprising a bearing member disposed on an axially outer side of said diaphragm spring, an axial extension on said bearing member extending axially through said central hole of said diaphragm spring, a transverse annular flange extending radially outwardly from said axial extension and being axially spaced from said bearing member, said transverse flange having an outer diameter greater than the diameter of said central hole, said transverse flange axially bearing against an axially inner side of said diaphragm spring for applying traction to said diaphragm spring for controlling the operation of the clutch, selected radial fingers of said diaphragm spring defining means for passing said transverse flange through said central hole from said axially outer side to said axially inner side with said transverse flange being transverse to an axial axis of said assembly and at an acute angle to the general plane of said diaphragm spring.

4,601,380

APPARATUS FOR CHECKING THE VALIDITY OF COINS

Robert Dean, Farnham Common; Peter J. Reyner, Northwood, and Derek Hutchinson, Hillingdon, all of England, assignors to Mars Incorporated, McLean, Va.

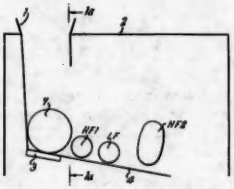
PCT No. PCT/GB82/00033, § 371 Date Sep. 10, 1982, § 102(e) Date Sep. 10, 1982, PCT Pub. No. WO82/02786, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 11, 1982, Ser. No. 425,072

Claims priority, application United Kingdom, Feb. 11, 1981, 8104175; Dec. 10, 1981, 8137250

Int. Cl.[4] G07D *5/08*

U.S. Cl. 194—318 32 Claims



16. Apparatus for checking the validity of coins, the apparatus requiring electrical power for its coin checking operation, and comprising circuitry arranged to establish a changing magnetic field in an examination region, and to determine whether the degree of interaction between a coin, when in the examination region, and the field is indicative of an acceptable coin, said circuitry including electrical circuit sections which are adapted to be individually powered-up; means for sensing the arrival of a coin for checking; and control means arranged to power-up, in response to the sensing means sensing coin arrival, each of said circuit sections through periods when its operation is required for a coin checking operation, but not through other periods.

4,601,381

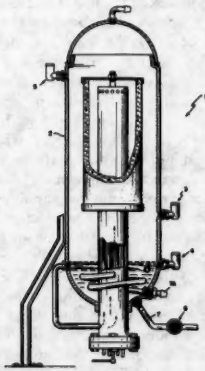
FLUID VACUUM DISTILLATION SYSTEM

August R. Nukala, Galien; Arthur Perez, Buchanan, and Timothy L. Brumfield, Niles, all of Mich., assignors to RPR Filtration Systems, Inc., South Bend, Ind.

Continuation-in-part of Ser. No. 520,798, Aug. 5, 1983. This application Sep. 26, 1983, Ser. No. 535,998

Int. Cl.[4] B01D *3/10*

U.S. Cl. 196—114 8 Claims



1. A fluid recovery system comprising:

a vacuum vessel including fluid inlet means for supplying fluid to be cleaned to the vessel and fluid outlet means for withdrawing cleaned fluid from the vessel;

means for causing at least a portion of the fluid to be vaporized intermediate the fluid inlet and outlet means;

at least one connection opening extending through a wall of the vacuum vessel; and

monitoring means for monitoring conditions of process fluid wherein said monitoring means includes a fluid level indicator means comprising a reservoir, generally horizontal conduit means for connecting one of said connection openings to the reservoir, and a float assembly having a float member operably disposed in said reservoir adjacent to said connection opening, wherein said float member is disposed so as to move between a first lowest position, indicative of an absence of fluid in the indicator, to a second highest position, indicative of a highest desired level of fluid in the indicator, before the cross-sectional flow area of said conduit means fills with fluid, wherein said indicator means is connected to said vacuum vessel via a single connection opening, said indicator means detachably connected, by threads or the like, to the connection opening, and wherein said float assembly includes a float guide, said float member mounted so as to move along the float guide in response to fluid level changes in the reservoir.

4,601,382

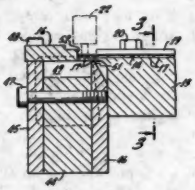
PICK-STATION AND FEED APPARATUS IN PICK-AND-PLACE MACHINE

William E. Roberts, Rolling Hills Estates, and Alfred M. Nelson, Redondo Beach, both of Calif., assignors to Excellon Industries, Torrance, Calif.

Filed Jan. 31, 1984, Ser. No. 575,559

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—432 8 Claims



1. In a pick-and-place machine that feeds chips in a row toward a pick station, said chips having magnetizable portions, a feeding and positioning apparatus for both positioning each chip at said station and preventing shingling of the chip at said station, said assembly comprising:

(a) means to feed chips in a row to a pick station from which said chips may be removed to a point of use,

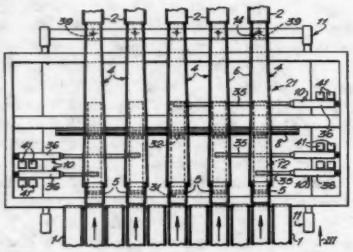
(b) stop means formed of a magnetizable material at said pick station for stopping the forward chip thereat, and

(c) means for establishing a magnetic circuit adjacent said pick station in one path through said stop means and through the magnetizable portions of said forward chip for magnetically holding said forward chip in abutment with said stop means, and in another path for magnetically holding down at least the rear of said forward chip to prevent shingling, said means for establishing a magnetic field including a permanent magnet disposed adjacent said pick station and having a first pole piece in the vicinity of the rear of said forward chip and a second pole piece in magnetic circuit relationship with said stop means, said magnet being spaced below said stop means so that there is an air space to aid in shaping the magnetic circuit.

4,601,383
HANDLING OF BISCUITS OR LIKE LAMINAR ARTICLES

John G. Phillipson, Peterborough, United Kingdom, assignor to Baker Perkins Holdings PLC, United Kingdom

Filed Nov. 30, 1983, Ser. No. 556,691
Claims priority, application United Kingdom, Dec. 11, 1982, 82 35392
Int. Cl.[4] B65G 47/68
U.S. Cl. 198—448 7 Claims



1. Apparatus for handling biscuits and like fragile, laminar articles stacked in an on-edge formation of article strings, comprising:

a plurality of article delivery channels, each having an outlet;

a reduced number of article receiving channels, each having an inlet; and,

article transfer means disposed between the delivery and receiving channels, and operable to receive batches of articles from selected delivery channels in a predetermined manner and transport selected batches to the receiving channels, whereby the overall number of strings of articles is reduced, said transfer means comprising:

a transfer trough for each article receiving channel, each transfer trough being formed by a relatively long section having one end mounted for swivel movement within a receiving channel inlet and a relatively short section having one end alignable with at least two delivery channel outlets;

means smoothly interfitting the remaining ends of each section with the other while allowing relative movement between the interfitted ends; and,

means operable to displace the relatively short section between delivery channel outlets,

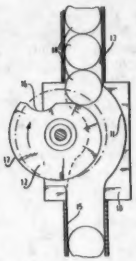
the delivery channels, the troughs and the receiving channels remaining in general alignment and forming a substantially continuous and unobstructed transfer path not withstanding the relative movements thereof, whereby the fragile articles may be handled without damage.

4,601,384
APPARATUS FOR FEEDING CAN BODIES

Hendrik D. van Doren, Deventer, Netherlands, assignor to Thomassen & Drijver-Verblifa NV, Deventer, Netherlands

Filed Sep. 8, 1981, Ser. No. 300,348
Int. Cl.[4] B65G 29/00
U.S. Cl. 198—481.1 2 Claims

2. A device for conveying cylindrical objects along an arcuate path, a shaft having an axis, said path being concentric with said shaft and being at least in part defined by a guide member, and a driving member carried by said shaft for sequentially moving cylindrical objects along said path, said driving member being in the form of a cam member having a peripheral surface which includes at least one partially spiral-shaped part,

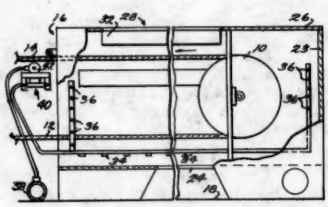


said partially spiral-shaped part including a linearly spiral-shaped part and a quadratically spiral-shaped part.

4,601,385
SELF-CLEANING TAIL PIECE

Charles S. Sloan, Rte. 1, Box 77 E, and Norman G. Sloan, Rte. 1, Box 77D, both of Foster, W. Va. 25081

Filed Mar. 14, 1984, Ser. No. 589,231
Int. Cl.[4] B65G 45/00
U.S. Cl. 198—495 5 Claims



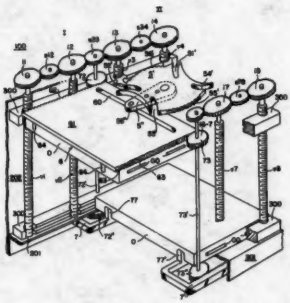
1. In an endless conveyor system for mined particulate material: an endless belt conveyor including a horizontal tail roller, an endless belt looped over the tail roller and having an upper run moving away from the tail roller and a lower run moving toward the tail roller; a water supply conduit for supplying water under pressure an enclosure surrounding the tail roller and the adjacent portions of the upper and lower belt runs, the enclosure having a bottom wall beneath the lower belt run, side walls located laterally of the ends of the tail roller and a top wall above the upper belt run, the top wall having an opening therein through which mined material to be conveyed can be deposited on the upper belt run; water spray means within the enclosure for spraying water into the enclosure so as to form a slurry with particulate material which bypasses the upper run of the belt and with dust particles within the enclosure; valve means connected between said water supply conduit and said water spray means for supplying water to said spray means; means for opening and closing the valve means mechanically connected to the valve means and to a moving part of the conveyor such that the valve means opens in response to running of the conveyor and closes in response to non-running of the conveyor; and slurry conveying means for pumping the slurry to the upper run of the belt, said slurry conveying means including a mechanical slurry conveyor, a mechanical drive connection between the slurry conveyor and a rotating portion of said endless belt conveyor, a slurry pump for receiving slurry from the slurry conveyor and for pumping the slurry to the upper run of said endless belt conveyor and a mechanical drive connection between the slurry pump and a moving portion of said endless belt conveyor.

4,601,386

DEVICE FOR MOVING OBJECTS

Flamino Antonello, Vaduz, Liechtenstein

Filed Nov. 15, 1983, Ser. No. 551,855
Int. Cl.[4] B65G 1/12
U.S. Cl. 198—576 31 Claims



1. In a transfer mechanism including a first carriage, for moving material or objects engageable with said carriage, the combination comprising:

a drive gear;

transfer means for moving said material or objects with respect to said carriage;

a first maltese gear connected to said carriage and driven by said drive gear so as to move said carriage; and

a second maltese gear connected to said transfer means and driven by said drive gear so as to move said material or objects with respect to said carriage;

wherein said first and second maltese gears are alternatively driven by said drive gear, and

wherein the circumference of each of said maltese gears comprises a pair of diametrically opposed gear tooth segments, a pair of diametrically opposed concave segments, and a somewhat radially inwardly depending opening disposed between each adjacent gear tooth and concave segment.

4,601,387

TRANSPORT PATH FOR PAPER PRODUCTS WITH SPEED REDUCTION, PARTICULARLY FOR PRINTING MACHINERY IN COMBINATION WITH FOLDING APPARATUS

Ingo Köbler, Anhausen, Fed. Rep. of Germany, assignor to M.A.N. ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,900
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1983, 3332809; Oct. 26, 1983, 3338814
Int. Cl.[4] B65G 15/14
U.S. Cl. 198—626 15 Claims

1. Paper handling apparatus to reduce the speed of transport of paper elements (E) in a tranport path (A) having

an endless transport belt means (4, 14, 24, 104, 240) located to grip the paper and transport the paper from a receiving position to a utilization position, while decelerating the paper during transport thereof in the transport path,

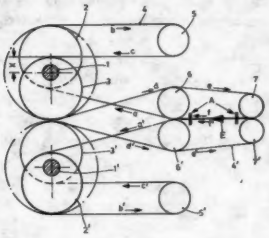
comprising, in accordance with the invention, eccenter pulley means including first and second eccenter pulleys (2, 13, 23, 220; 3, 12, 22, 230) located in respective different planes;

a common shaft (1, 11, 21) connected to rotate with said first and second eccenter pulleys,

said first and second eccenter pulleys having the same eccentricity (x) with respect to their common shaft;

said belt means being guided in a first run (a, 1a, 2a, 20a) from the transport path to loop, in part, about a first eccenter pulley (2, 13, 23, 220);

first guide pulley means (5, 15, 27, 270) guiding a second run (c, 1c, 2c, 20c) of the belt means (4, 14, 24, 104, 240) from said first eccenter pulley (2, 13, 23, 220) into the plane of the second eccenter pulley (3, 12, 22; 230);



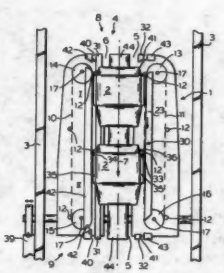
and second guide pulley means (6, 18, 30, 300) guiding a third run of the belt means (4, 14, 104, 24, 240) from said second second eccenter pulley back to the plane of the transport path.

4,601,388

APPARATUS FOR ALIGNING FLAT ARTICLES

Martin Blümle, Horhausen, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,375
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403909
Int. Cl.[4] B65G 19/02
U.S. Cl. 198—726 4 Claims



1. An apparatus for aligning flat articles such as envelopes, flat bags or the banks therefor or the like, said apparatus comprising:

(a) an article-supporting slideway having longitudinal slots formed therein;

(b) laterally arranged toothed belts disposed on either side of said slideway, said belts being guided around reversing sprockets having rotational axes perpendicular to said slideway;

(c) article-engaging entraining members supported by said belts, said entraining members including support rolls and a pin whose free end extends through said slots of said slideway to engage said articles; and

(d) lateral guides for said entraining members on which said support rolls of said entraining members run and are guided, said guides being arranged to guide said entraining members supported by the respective laterally arranged belts to coverage towards one another funnel-fashion over a first portion of their path and to move parallel to one

another over a second portion of their path, wherein each lateral guide includes a guide disposed above and below the edges of the associated lateral toothed belt, and the pin of each entraining member is supported by an upper roll and a lower roll which are correspondingly guided by the upper and lower guides of the respective lateral guide,

said toothed belt and sprockets, said lateral guides, said support rolls and a major portion of each of said pins of said entraining members being disposed below said slideway,

said toothed belts and said lateral guides being so disposed that in the case of an envelope blank the free end of the pin of the entraining members extending through the slots of said slideway engage at the corner between the side flap and the closure flap of the envelope blank.

4,601,389

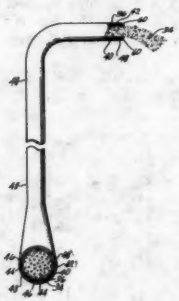
TUBULAR CONVEYOR SYSTEM AND OPERATING METHOD

Michael A. Minovitch, 2832 St. George St., Los Angeles, Calif. 90027

Continuation of Ser. No. 354,754, Mar. 4, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 652,146

Int. Cl.[4] B65G *17/00*

U.S. Cl. 198—804 **14 Claims**



1. A method for conveying loads through a flexible conduit comprising the steps of:

enclosing the inside and outside walls of said flexible conduit within a flexible elongated toroidal conveying medium having a duct-like carrying run adjacent the inside walls of said conduit and a duct-like return run adjacent the outside walls of said conduit, said flexible toroidal conveying surface having elastic properties in both transverse and longitudinal directions;

attaching portions of the inside surface of said toroidal conveying medium to said flexible conduit such that said conveying medium moves substantially adjacent the inside and outside walls of said flexible conduit while said conduit is flexed to follow various paths;

enclosing the return run of said flexible toroidal conveying medium within a flexible outer conduit such that the separation distance between the flexible inner and outer conduits is substantially unchanged as the conduits are flexed along various paths; and

moving said toroidal conveying medium such that said carrying run forms an endless moving duct that can be moved to follow different paths by flexing said flexible outer conduit while conveying said loads,

4,601,390

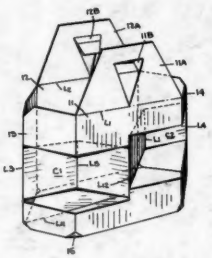
COLLAPSIBLE HAND CARRIER FOR BOTTLES

Roberta Rosenthal, 6 E. 30th St., New York, N.Y. 10016, and Hilaire H. Dubourcq, 110 Christopher St., New York, N.Y. 10014

Filed Jan. 28, 1985, Ser. No. 695,385

Int. Cl.[4] B65D *75/00*

U.S. Cl. 206—175 **10 Claims**



1. A repeatably usable collapsible hand carrier for bottles of standard size, the carrier being fabricated of flexible panel material and having a structure comprising:

A. front and rear side panels provided with complementary handle extensions;

B. left and right end panels hingedly joined to the end edges of the side panels;

C. a bottom panel hingedly joined to the bottom edges of the side panels and disconnected from the end panels, the bottom panel and the end panels all having a center fold to create a gusset whereby the carrier may be collapsed after use into a flat state by pressing the side panels together, and in doing so, causing the bottom panel and the end panel gussets to fold out, and the carrier may be erected for reuse by pulling the side panels apart; and

D. four snap-in corner sections formed at the junctions of the side and end panels, each section being defined by a pair of parallel slots spaced from the top and bottom edges of the panels and extending horizontally from the center fold of the related end panel and a vertical fold line on the related side panel, whereby when the hand carrier is erected and a corner section is pressed in at its junction, the section then reverses itself to set up within the interior of the carrier a corner cell adapted to accommodate a single standard bottle.

4,601,391

VENTILATED FABRIC COVER FOR STRINGED INSTRUMENTS

Richard Gibbs; Robert J. Reynolds, and Kevin Greenhaw, all of 301 W. 122nd St., Los Angeles, Calif. 90061

Filed Feb. 7, 1985, Ser. No. 699,721

Int. Cl.[4] A45C *11/00*

U.S. Cl. 206—314 **10 Claims**

1. A ventilated fabric cover composed of warp and weft fibers reinforced at selective portions for protecting delicate finish of a stringed instrument, having a front, side and rear peripheral outer surface, said ventilated fabric cover comprising:

a fabric base having a prescribed ventilated weave comprising interlaced moisture absorbent fibers; said prescribed ventilated weave having a sufficient number of interstices between adjacent fibers at least equal to the average mean diameter of said warp and weft fibers to prevent substantial muting of sound quality of the instrument as it is played; said fabric base being configured to extend about and surround the outer side and rear peripheral surfaces of the stringed instrument;

means for reinforcing said fabric base at selective portions

which typically contact body portions of a musician as said instrument is played;

means for tensioning said fabric base to effect a form fit with the outer surfaces of said instrument to be protected; said means for tensioning being disposed in a central portion of said fabric base and disposed at marginal edges of said fabric base;

wherein when said ventilated fabric cover is extended about said stringed instrument to surround the outer side and rear periphery, said cover provides protection of the delicate finish of the instrument against perspiration and marring, but will not adversely interfere with acoustical quality of sound from the instrument.

4,601,392

SAFETY RAZORS AND TRAVEL CAPS THEREFOR

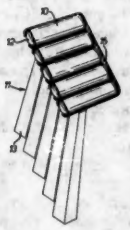
Wolfgang Althaus, Wuppertal, Fed. Rep. of Germany, assignor to Wilkinson Sword Limited, High Wycombe, England

Filed Nov. 14, 1984, Ser. No. 671,374

Claims priority, application United Kingdom, Dec. 2, 1983, 8332281

Int. Cl.⁴ A45C *11/26*

U.S. Cl. 206—349 **7 Claims**



1. A travel cap device for a plurality of T-shaped safety razors of the type having a razor head containing one or more blades and a handle extending away from said razor head, the device comprising a plurality of caps each shaped to fit over a respective razor head, each cap comprising a generally tubular wall having an opening extending along said wall from an open end of the cap up to a position beyond the mid length position of the cap to enable the head of its associated razor to be inserted into the cap until the handle is equidistant from the opposite ends of the cap said device further comprising means securing said caps together to receive said plurality of razors therein, the securing means between adjacent caps being frangible.

4,601,393

STACKABLE CARRIER OR CRATE FOR GOODS OR ARTICLES

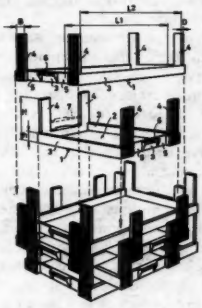
Simon J. M. Veenman, 's-Gravenzande, and Coenraad J. B. M. Benraad, Dedemsvaart, both of Netherlands, assignors to Simon J. M. Veenman, Maasdijk, Netherlands

Filed Oct. 16, 1984, Ser. No. 661,460

Claims priority, application Netherlands, Oct. 17, 1983, 8303572

Int. Cl.⁴ B65D *21/04*

U.S. Cl. 206—505 **9 Claims**



1. A plurality of rectangular trays for alternate transverse stacking one upon another each tray comprising

(a) a rectangular bottom having upstanding side and end walls of the same vertical height,

(b) four flat walled rectangular posts upstanding in pairs from each end of said end walls,

(c) the height of said posts being of a multiple of the height of said side and end walls of a tray,

(d) a flat walled handle extending from the outside of each end wall and lying intermediate said flat walled rectangular posts, and

(e) the space between said flat walled handle and said rectangular posts defining a cutout to provide a sliding interlock between a flat wall of said handle and one wall of said flat walled corner posts to assure an interlocked vertical nested alternately transversely disposed stack of trays for transport facilitating quick and easy removal of the trays from the stack.

4,601,394

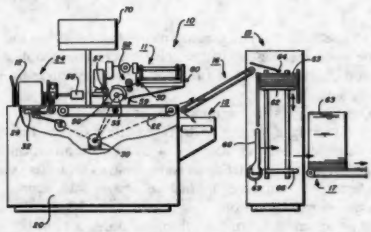
ZIP CODE SORTER FOR ARTICLE LABELING SYSTEM

Mark A. Hutner, Glenview, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed May 7, 1984, Ser. No. 607,872

Int. Cl.⁴ B07C *1/00*; G06F *15/20*

U.S. Cl. 209—3.3 **6 Claims**



1. In a labeling system including a supply of labels for use in addressing articles, selected labels being adapted to bear a

mark identifying a change in Zip Code group; a labeling head for addressing articles with said labels and stacking means for stacking said articles in stacks following addressing by said labeling head, said stacking means including a stacking elevator, and an infeed conveyor for transporting the addressed articles from said labeling head to said stacking elevator, the combination of:

(a) stack counter means programmable for a maximum stack count of addressed articles to be stacked on said stacking elevator;

(b) look ahead counter means programmable for a minimum stack count of addressed articles to be stacked on said stacking elevator;

(c) scanning means for scanning said labels ahead of the point where the addressed articles are conveyed by said infeed conveyor to said stacking elevator whereby to allow a control decision for operating said stacking means to be made before the article addressed with a label having a change in Zip Code group mark is conveyed by said infeed conveyor to said stacking elevator, said scanning means scanning ahead of said point by a label count at least equal to said minimum stack count; and

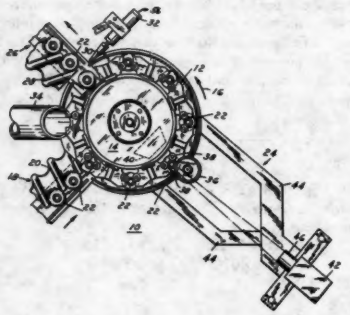
(d) control means responsive to attainment of said minimum stack count or detection of a change in Zip Code group mark to terminate stacking of the article stack in process by said stacking means, whereby where said article stacking is terminated in response to detection of a change in Zip Code group mark, the remaining articles in said Zip Code group to be stacked equal said minimum stack count.

4,601,395

INSPECTING AND SORTING OF GLASS CONTAINERS

John W. Juvinall, Ottawa Lake, Mich.; Sam Lovalenti, and William H. Rogge, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 23, 1984, Ser. No. 602,862
Int. Cl.[4] B07C *5/342*; G01N *21/32*
U.S. Cl. 209—526 **27 Claims**



1. A method of sorting transparent containers having defects in the container sidewalls, which defects affect optical transmission characteristics of the container sidewalls, said method comprising the steps of:

(a) rotating a said container about its central axis,

(b) directing a source of diffused illumination through the sidewall of the containers, with said illumination varying in intensity in a direction transverse to said axis as a predetermined function of position across said source in said transverse direction,

(c) positioning a camera which inlcudes a plurality of light responsive elements disposed in a linear array such that said array extends in a direction parallel to said axis so as to define a field of view parallel to said axis,

(d) identifying defects in the container sidewall as a function of differences in light energy sensed by adjacent ones of said light responsive elements by:

(d1) scanning said plurality of light responsive elements at increments of container rotation to develop a series of pixel signals from each said element corresponding to intensity of light at each said element at each said scan increment,

(d2) comparing pixel signals from each said element at each said increment to at least one pixel signal from the same said element at a differing said increment, and

(d3) identifying container sidewall defects as a function of differences between said compared signals, and

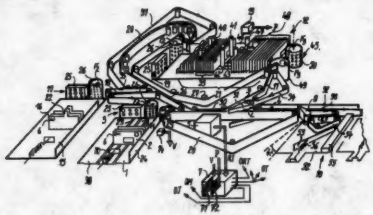
(e) rejecting a container in which a defect is so identified, whereby a defective container is sorted from commercially acceptable containers.

4,601,396

METHOD AND DEVICE FOR SORTING FLAT AND INDEXED ARTICLES

Claude Pavie, Houilles, France, assignor to HBS, France

Filed Nov. 26, 1984, Ser. No. 674,792
Claims priority, application France, Nov. 25, 1983, 83 18851
Int. Cl.[4] B07C *3/10*; G06F *15/20*
U.S. Cl. 209—569 **10 Claims**



1. Method for sorting flat, indexed articles, where said articles are stored in a magazine, extracted or unpiled therefrom one by one, each article being directed past a read head recognizing its indexing, sort commands are sent to a sorting device to receive and distribute each article to a sorting receptacle corresponding to its destination according to recognized destination indexes, whereby, the number of sorting receptacles being less than the total number of possible destinations, the following steps are cyclically performed:

articles having a destination for which no sorting receptacle is provided are put aside or bypassed to a buffer receptacle, while the remaining articles are sent to their respective sorting receptacles;

a marker is placed at the top of each pile of articles in the assigned sorting receptacles;

new destinations are then assigned to all the existing sorting receptacles;

and all the buffered articles are then redirected past the read head and sent to the sorting receptacles having the new destinations.

4,601,397

MACHINE-RETRIEVABLE CARD AND CARD RETRIEVAL APPARATUS AND METHOD THEREFOR

Paul J. Neumeier, Loveland, Ohio, assignor to Access Corporation, Cincinnati, Ohio

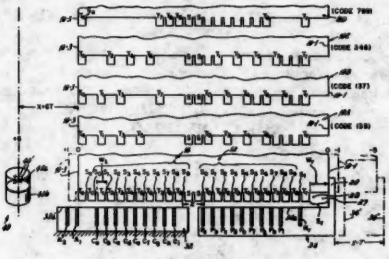
Filed Sep. 21, 1984, Ser. No. 653,131
Int. Cl.[4] B07C *5/36*
U.S. Cl. 209—608 **15 Claims**

1. A method of selecting a desired card encoded along a sorting edge thereof from a deck of similarly encoded undesired cards, said desired and undesired cards each including leading and trailing edges between which is located said sorting edge having a complementary code region having selec-

tively removable complementary code teeth, with each complementary tooth having a complementary slot associated therewith rearwardly thereof, a primary code region having selectively removable primary code teeth, with each primary tooth having a primary slot associated therewith forwardly thereof, said card being encodeable in an M out of N digit code format with complementary code teeth remaining, and primary code teeth removed, only at the complementary and primary code locations corresponding to the M digits, an acquisition tooth having a rear edge disposed a predetermined distance rearwardly of the leading edge of said card, and a return tooth having a forward edge disposed a predetermined distance forwardly of said trailing edge, said method comprising:

(a) combining the desired and undesired cards into a single deck with their sorting edges aligned;

(b) introducing a complementary and a primary sorting element, which are disposed transversely relative to the sorting edges of the desired and undesired cards, into respective complementary and primary notches of all the cards associated with the first encoded digit of the desired card and moving the primary sorting element rearwardly the width of one tooth to separate the single deck of cards into only (1) a first group, which is maintained stationary by the stationary first digit complementary sort element, containing only cards which each are encoded with the first digit and (2) a second group, which is moved rearwardly by the moving first digit primary sorting element,



containing only the remaining cards which each are not encoded with the first digit, the first and second groups being physically separated from each other in a direction parallel to the sorting edges thereof a distance equal to the width of one tooth;

(c) introducing a complementary and a stationary sorting element transversely disposed to the sorting edges of all cards into the respective complementary and primary notches associated with the second encoded digit of the desired card located in the first group and moving the primary sorting element rearwardly the width of one tooth to selectively separate the first and second groups of cards into only (1) a third group, which is maintained stationary by the stationary second digit complementary sort element, containing cards which each are encoded with both the first digit and the second digit, and (2) a fourth group collectively containing the remaining cards which do not each contain both the first and second encoded digits, the fourth group consisting of only two subgroups of cards, formed by said movement of said second digit primary sort element, which are separated relative to each other a distance equal to the width of one tooth in a direction parallel to their respective sorting edges, the third group of cards being separated from each of the two subgroups of the fourth group a distance of at least one tooth width in a direction parallel to the sorting edges thereof;

(d) introducing an acquisition member transversely disposed to the sorting edges of all cards immediately rearwardly of the acquisition tooth of the desired cards in the third group and urging the rearmost subgroup of the fourth group of cards forwardly to combine the two subgroups of the fourth group of cards into a single combined fourth group of cards, the combined fourth group of cards being spaced by the action of said acquisition member from the third group of cards by at least one tooth width in a direction parallel to the sorting edges thereof;

(e) introducing a complementary and a stationary sorting element disposed transversely relative to the sorting edges of the cards into the respective complimentary and stationary notches associated with the third encoded digit of the desired card located in the third group and moving the primary sorting element rearwardly the width of one tooth to separate the third group of cards and the combined fourth group of cards into only (1) a fifth group, which is maintained stationary by the third digit complementary sort element, containing cards each having all three of the encoded first, second, and third digits, and (2) a sixth group containing the remainder of the cards, the sixth group consisting of only two subgroups, formed by the movement of said third digit primary sort element, spaced relative to each other one tooth width apart in a direction parallel to the sorting edges thereof, the two subgroups of the sixth group collectively containing all cards not each having all the first, second, and third encoded digits, the fifth group of cards being spaced from each of the two subgroups of the sixth group by a distance equal to at least one tooth width in a direction parallel to the sorting edges thereof; and

(f) introducing the acquisition member transversely disposed to the sorting edges of all cards immediately rearwardly of the acquisition tooth of the desired cards in the fifth group and urging the rearmost subgroup of the sixth group of cards forwardly to combine the two subgroups of the sixth group of cards into a single combined sixth group of cards, the combined sixth group of cards being spaced by the action of the acquisition member from the fifth group of cards by at least One tooth width in a direction parallel to the sorting edges thereof.

4,601,398

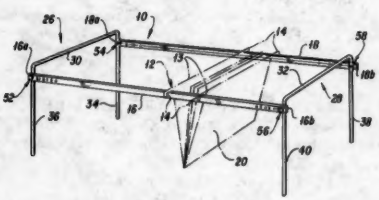
FRAME FOR HANGING FILES

Jack Solomon, Long Beach, N.Y., assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Mar. 26, 1984, Ser. No. 593,604

Int. Cl.[4] A47B 65/00

U.S. Cl. 211—46 **5 Claims**



1. A frame for supporting a multiplicity of files that have reenforced top edges formed with extensions intended to engage a pair of horizontal parallel side rails and that have a web extending between said edges and hanging downwardly therebetween, said frame comprising:

a pair of horizontal side rails engageable by said extensions, each side rail being formed with at least one aperture extending therethrough near each end thereof;

a pair of end supports each comprising a horizontal cross bar and a pair of vertical legs, the legs and cross bar of each end support having generally the shape of an inverted U;

each leg being formed on the side thereof opposite the other leg of the same end support and near the top thereof with

a recess and with a threaded bore having two ends, each bore communicating at one of said ends with one of said recesses and at the other of said ends with the side of the leg facing the other leg of the same end support, the recess being within the lateral dimensions of the end support so as not to cause any substantial lateral projection beyond the legs, said side rails being wedged entirely within said recess so as to be entirely within the lateral dimensions of the end support and parallel to the legs;

four bolts each having a threaded shank passing through an aperture in one of said side rails and one of said threaded bores, each aperture in said side rails having a diameter greater than that of said shank, and said shank being threaded into one of said bores; and

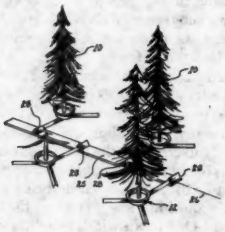
each recess engaging a side rail adjacent top and bottom edges thereof and being otherwise spaced apart therefrom.

4,601,399

TREE STAND SUPPORT AND DISPLAY APPARATUS

Donald I. Brenteson, 811 W. Warner Rd., Tempe, Ariz. 85284

Filed Oct. 1, 1984, Ser. No. 656,476
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—60.1 **5 Claims**



1. A tree stand support and display apparatus comprising:

a. a plurality of tree stands each adapted to be secured to the trunk of a tree to be displayed, and each including a plurality of legs extending therefrom;

b. an elongated base member having a flat horizontal surface parallel to the ground and a plurality of sockets positioned along said base member, said base member contacting and being supported by the ground and having an axis extending parallel thereto;

c. each of said sockets receiving a leg on a corresponding one of said stands.

4,601,400

HOLDER FOR KNIVES AND THE LIKE

Delbert L. Buchanan, Lake Oswego, Oreg., and Keith W. Buchanan, Fairbanks, Ak., assignors to Buchanan Industries, Lake Oswego, Oreg.

Filed Sep. 12, 1983, Ser. No. 531,261
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—70.7 **4 Claims**

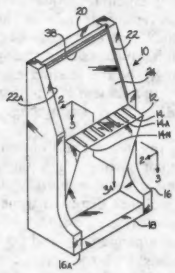
1. In a storage apparatus for knives and the like having a handle and a blade, said apparatus having a holder member with a top end and a bottom end, said top end having slots therein for receiving said blade and holding said knives in vertical rest position with said handle projecting upwardly from said holder member, the improvement comprising:

a. means pivotally connecting said bottom end to said apparatus, enabling said holder member rotatably to tilt forward from said vertical rest position;

b. means arresting said forwardly rotatable tilt at an angle enabling said handle easily to be grasped and said knives to be withdrawn, and including:

1. said apparatus having side members with forwardly extending grooves therein, said grooves ending short of the front surface of said side member;

2. said holder members having side surfaces with projections therefrom to slidingly matingly engage said grooves; and



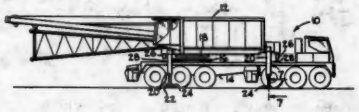
3. said forwardly rotatable tilt of said holder member being arrested by the engagement of said groove endings by said projections.

4,601,401

CENTERING ARRANGEMENT FOR REDECKING OF CRANE UPPER

Leroy L. Wittman, Marion, and David W. Olsen, Palo, both of Iowa, assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 487,640, Apr. 22, 1983, abandoned. This application May 7, 1985, Ser. No. 731,755
Int. Cl.[4] B66C 23/36
U.S. Cl. 212—180 **4 Claims**



1. A centering means for the redecking of a crane having an upper supported on retractable legs above a carrier, the upper and carrier each including complementary swing components which must be substantially aligned to effect redecking, comprising:

a plurality of concave members attached to said carrier;

an equal number of vertical centering pins slidably carried by said upper, each centering pin having a convex end complementary with one of said concave members;

said concave members positioned on said carrier so that said swing components are substantially aligned when said convex ends are fully seated in the corresponding concave members;

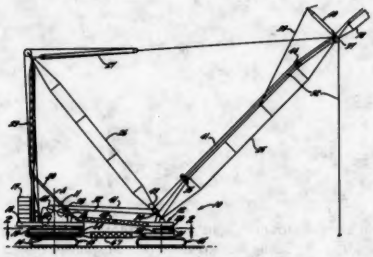
latch means including a retaining pin for selectively holding said centering pins in one of an extended position, wherein said swing components on said upper and said carrier are vertically spaced when said convex ends are in contact with said concave members, and a retracted position, wherein said convex ends are vertically spaced from the concave members when said upper is fully decked on said carrier;

float means attached to each leg permitting lateral shifting of said upper relative to said carrier to allow full seating of said convex ends in said concave members as said legs are retracted with said latch means holding said centering pins in their extended position.

4,601,402
STEERABLE CONCENTRIC RING SEGMENT SUPPORTED LIFT CRANE

Percy R. Helm, and James G. Morrow, Sr., both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 128,248, Mar. 7, 1980, Pat. No. 4,316,548. This application May 4, 1981, Ser. No. 259,932
Int. Cl.[4] B66C *23/78*
U.S. Cl. 212—189 5 Claims

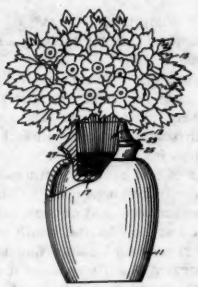


1. A lift crane having a forwardly inclined boom and a rearwardly inclined mast, said boom and mast being pivotally mounted on a boom carrier mechanism, rigging means interconnecting the tip of the mast and the tip of the boom, counterweight means supported by rollers on a rear ring segment for rotation about a vertical axis, means interconnecting said counterweight and the top of said mast, said boom carrier supported by rollers on a front ring segment for at least partial circumferential rotation about said vertical axis, said front and rear ring segments being concentric and having different radii of curvature, said front and rear ring segments each mounted on front and rear mobile support mechanisms respectively, means interconnecting said front and rear support mechanisms to permit movement of said crane as a unit, and said interconnecting means including a rotatable cage-like structure at least partially surrounding said rear ring segment to permit steering of said rear mobile support mechanism without altering the fore and aft alignment of said boom carrier mechanism and said counterweight support means.

4,601,403
CONTAINER WITH INVERTIBLE LID

Hilda S. Pollitz, Riverside, Calif., assignor to Teleflora Corporation, Los Angeles, Calif.

Filed Sep. 4, 1984, Ser. No. 646,973
Int. Cl.[4] B65D *51/28*
U.S. Cl. 215—228 2 Claims

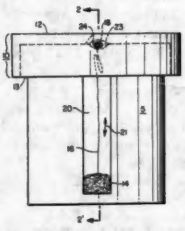


1. In combination:
a container having a circular, flared lip that defines an open upper end, the lip having a substantially uniform vertical radius; and
a cup-shaped lid having an open end, a closed end, a side wall located between the two ends, and a circular rim projecting outwardly from the side wall, approximately midway between the lid's open end and closed end, the lid being selectively placeable in the open upper end of the container in either of two orientations, one orientation with the open end facing upwardly and with the circular rim of the lid conformably engaging the circular, flared lip of the container, to seal the container's interior, and the other orientation with the closed end facing upwardly and with the circular rim of the lid conformably engaging the circular, flared lip of the container, to seal the container's interior, wherein when the open end of the lid faces upwardly, the lid is adapted to hold a floral arrangement, and wherein when the closed end of the lid faces upwardly, the lid provides a decorative appearance, wherein the side wall is substantially cylindrical, with a uniform inner surface and with a height at least as large as its diameter, wherein the closed end is defined by a flat wall of uniform thickness and substantially peripendicular to the cylindrical side wall such that the lid can be supported on a level surface with its open end facing upwardly, and wherein the outwardly-projecting circular rim is defined by a first vertically-curved surface having a uniform vertical radius substantially equal to the uniform vertical radius of the container's lip and blending smoothly with the portion of the side wall adjacent to the open end and further defined by a vertically-curved second surface having a uniform vertical radius substantially equal to the uniform vertical radius of the container's lip and blending smoothly with the portion of the side wall adjacent to the closed end, whereby the lid conformably rests in the container's open upper end in either of its two orientations.

4,601,404
CONTAINER AND CLOSURE WITH TAMPER INDICATING MEANS

Horace L. Shivers, 21 Filmore St., Trenton, N.J. 08638

Filed Apr. 22, 1985, Ser. No. 725,917
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—230 7 Claims



1. An improved container and means for opening said container with tamper indicating means comprising:
a closed container;
means for opening said container attached thereto;
an elongated member having a first end and a second end;
a transparent enclosure having an interior wall, said enclosure being in contact with said container;
a piece forming a part of said first end of said member, said piece being connected to said means for opening said container;
means for visibly marking said enclosure located inside said enclosure and attached to said second end of said member, said means for visibly marking being disposed inside said enclosure whereby removal of said means for opening said

container visibly marks at least a part of the interior wall of said enclosure;

said means for opening said container further comprising an inner cap having a well therein adapted to receive said piece and an outer cap adapted to be permanently connected to said inner cap; and,

said inner cap and said outer cap being connected to said piece and to a portion of the elongated member whereby removal of said means for opening said container visibly marks at least a part of said enclosure.

4,601,405

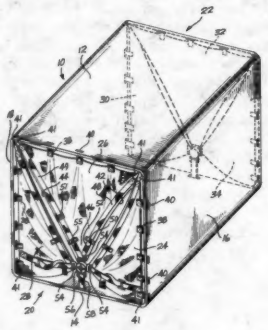
CLOSURE SYSTEM FOR A CONTAINERIZED CARGO HANDLING SLEEVE

Gerald K. Riemer, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 26, 1985, Ser. No. 781,122

Int. Cl.[4] B65D *88/00*

U.S. Cl. 220—1.5 **5 Claims**



1. For use in handling containerized cargo and baggage, a device for closing an end of a cargo holding sleeve, the device comprising:

a plurality of generally triangular sheets made of flexible material, each sheet having a base edge connected to a sidewall of said sleeve, and a pair of second and third edges which converge generally away from said base edge, said pair of convergent edges converging to form an apex portion of each sheet, wherein said base edge of each respective sheet is connected to a separate sidewall of said sleeve; and

means for connecting said apex portion of each sheet to the apex portions of the other sheets, wherein such connection pulls said sheets adjacent each other in a manner so that they cooperate with each other to substantially close said end of said sleeve.

4,601,406

INJECTION MOLDED CONTAINER

Henryk Dudzik, Mansfield, United Kingdom, assignor to Mardon Illingworth Ltd, Nottinghamshire, United Kingdom

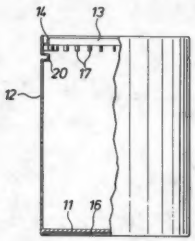
Filed Jun. 24, 1985, Ser. No. 747,981

Int. Cl.[4] B65D *1/46, 25/32*

U.S. Cl. 220—66 **7 Claims**

1. A container comprising:

(a) a body formed as a single injection moulding including as parts of said moulding a cylindrical wall, a rim, a pair of bosses and retaining means associated with said bosses, said cylindrical wall having a bottom closing one end of the cylindrical wall, said rim being adjacent the opposite end of the cylindrical wall and projecting radially inwardly and defining a mouth, the rim being adapted to receive a plug-fitting lid to close the mouth, said pair of cylindrical bosses being located at diametrically opposite sides of the cylindrical wall and axially spaced from said rim, said bosses projecting from an internal surface of the cylindrical wall towards each other, each boss having a socket defined by an inner cylindrical surface having an opening at the external surface of the cylindrical wall and closed at the opposing end, said retaining means being offset with respect to said inner cylindrical surface, and



(b) a handle mountable in yoke fashion on the body, the handle comprising a strap and a pair of spigots, one at each end of the strap, each spigot having a peripheral surface rotatably engagable with said inner cylindrical surface of a respective one of said bosses and having means engagable with the retaining means associated with said bosses, whereby the handle is rotatably retained on the body.

4,601,407

MULTI-LAYERED CONTAINER

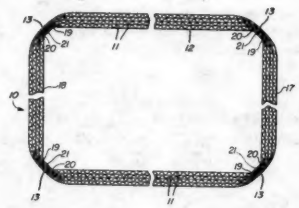
David F. Gillard, Surrey, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Jul. 20, 1984, Ser. No. 632,871

Claims priority, application United Kingdom, Jan. 19, 1984, 8401373

Int. Cl.[4] B65D *5/02*

U.S. Cl. 220—443 **13 Claims**



1. A container comprising a sleeve of multiple layers of compressible material made by winding a compressible sheet layer around a mandrel,

said sleeve having an outer surface and an inner surface and said sleeve having at least four flat sides with crushed corners between adjacent sides, said corners crushed from said outer surface to said inner surface,

at least two opposing corners of said sleeve being bevelled corners, each of said bevelled corners having two spaced creases on the inner surface of the sleeve and an inner bevel surface between said creases, said beveled corners being crushed across the full width of said inner bevel surface, said creases each comprising a single line, each of said crease located directly adjacent to a flat inner surface of said sleeve, each inner bevel surface and associated creases together being substantially planar, and characterized

wherein a triangular space bounded by said inner bevel surface and the inner surface of the adjacent sides of said

sleeve is formed at each bevelled corner when each corner is in a fully closed position to allow the sleeve to be collapsed so fully closed folded corners have adjacent sides substantially parallel and in contact without substantial force applied.

4,601,408

NAIL FEEDING DEVICE

Lars T. Billing, Värmlandsgatan 2, Helsingborg, and Stig Olofsson, Angantyrvägen 1, Djursholm, both of Sweden

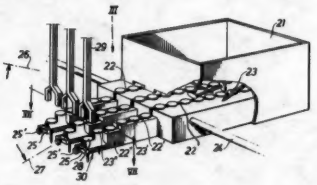
PCT No. PCT/SE83/00199, § 371 Date Jan. 6, 1984, § 102(e) Date Jan. 6, 1984, PCT Pub. No. WO83/04209, PCT Pub. Date Dec. 8, 1983

PCT Filed May 20, 1983, Ser. No. 573,934

Claims priority, application Sweden, May 28, 1982, 8203346

Int. Cl.⁴ B23Q *7/12;* **B65H** *9/00*

U.S. Cl. 221—168 **3 Claims**



1. A device for the positioning and individual feeding of nails, comprising a nail receiving container which is pivotal upwards and downwards about a horizontal pivot shaft and in the bottom of which there are formed one or more slots which are substantially perpendicular to said pivot shaft and in which the shanks of the nails can be accommodated while the nails are maintained suspended by their upper parts, for instance their heads, characterized in that each slot (22) passes and extends beyond the wall located at the discharge end of the container (21), and forms a feed slot (22', 22") which protrudes outside the container (21) and in the end portion (30) of which there is provided a stop (25) of such a design that the outermost nail (28) of the fed nails (23") is maintained in a correct position at the outermost end of said end portion (30) which is spaced from said pivot shaft (24) such that the end portion will perform a substantially vertical oscillating movement between a lower end position (27) and an upper end position (26); the height of the side walls (52) of the slot (51) being greater than the full length of the suspended nails (53); and an ejector plate (62) pivoted between the side walls of the slot (51) and arranged to swing upwards in the slot as the terminal portion (59) moves from its lower position (60) to its upper end position (61) the ejector plate (62) on its upward movement pushing the suspended nails (53) out of the slot (51) into the nail container (50), thus, freeing the slot (51) from nails but for a few nails (53, 53' in FIG. 2) suspended by the outer slot portions.

4,601,409

LIQUID CHEMICAL DISPENSING SYSTEM

Joseph A. DiRegolo, San Leandro, Calif., assignor to Tritec Industries, Inc., Mountain View, Calif.

Filed Nov. 19, 1984, Ser. No. 672,798

Int. Cl.⁴ G01F *11/00;* **B67D** *1/00*

U.S. Cl. 222—1 **11 Claims**

1. An improved system for dispensing liquid chemicals, such as photoresist, from a pair of containers comprising:

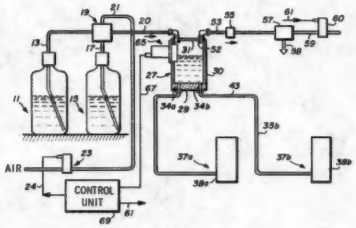
a. first conduit means mounted in liquid-flow communication with a first container of the pair for carrying liquid therefrom;

b. second conduit means mounted in liquid-flow communication with a second container of the pair for carrying liquid therefrom;

c. controllable valve means connected in liquid-flow communication with the first and second conduit means to selectively, in a first position, block the flow of liquid through the second conduit means while permitting flow through the first conduit means and, in a second position, block the flow of liquid through the first conduit means while permitting flow through the second conduit means;

d. reservoir means connected in liquid-flow communication with the controllable valve means to receive liquid from the first and second conduit means via the controllable valve means, the reservoir means including a container for holding a volume of received liquid;

e. pump means connected in liquid-flow communication with said container for withdrawing liquid therefrom;



f. level sensing means mounted to monitor the level of liquid within said container and to provide an output signal indicative of whether the liquid level has fallen below a predetermined location;

g. switching means connected to receive the output signals from the level sensing means and mounted to actuate the controllable valve means in response to such signals to switch from flow communications with one of the containers of the pair to the other; and

h. air withdrawal means connected to the reservoir means to withdraw air from the reservoir means above the level of liquid therein.

4,601,410

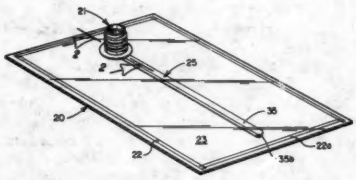
COLLAPSED BAG WITH EVACUATION CHANNEL FORM UNIT

Curtis J. Bond, Worthington, Ohio, assignor to Liqui-Box Corporation, Worthington, Ohio

Continuation-in-part of Ser. No. 594,761, Mar. 29, 1984. This application Dec. 14, 1984, Ser. No. 681,746

Int. Cl.⁴ B65D *35/00*

U.S. Cl. 222—92 **27 Claims**



1. A substantially flat collapsed bag with a form insert unit disposed therein, said bag comprising opposed superimposed substantially flat walls having a spout extending outwardly from one of the walls adjacent an end of the bag and having an open inner end, said form insert unit comprising an elongated form connected to the spout and being of channel shape to direct the bag contents thereto when the filled bag is evacuated and collapses therearound, said form unit also including a connecting ring which connects with the spout and which has the elongated channel form flexibly attached thereto, said

connecting ring fitting into the inner end of the spout and having a portion projecting axially inwardly therefrom, said axially projecting portion of the connecting ring and the elongated channel form being of substantially the same thickness.

4,601,411
ELECTROMAGNETIC METERING DEVICE HAVING ASYMMETRICAL LEVERS

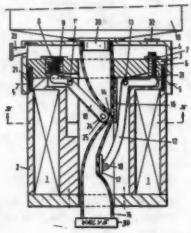
Gerardus J. J. van Overbruggen, Vianen, Netherlands, assignor to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel, Utrecht, Netherlands

Filed Nov. 4, 1983, Ser. No. 548,773

Claims priority, application Netherlands, Dec. 16, 1982, 8204867

Int. Cl.⁴ G01F *11/02*

U.S. Cl. 222—207 **2 Claims**



1. A device for metering liquids comprising:

a housing;

an electromagnet mounted in said housing, said electromagnet having a bore extending in an axial direction and an armature mounted adjacent to the electromagnet and perpendicular to said bore for movement in said axial direction in response to actuation of said electromagnet;

a metering hose extending through said bore in said axial direction and having an outlet valve;

a first lever pivotably mounted in said housing and pivoted by said axial movement of said armature to engage and completely close said hose at a first location within the bore; and

a second lever mounted in said housing pivoted by said axial movement of said armature to engage and deform said hose at a second location between said first location and said outlet valve.

4,601,412
POLYMERIC GREASE GUN

Donald E. Martin, Waukesha, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Nov. 7, 1983, Ser. No. 549,351

Int. Cl.⁴ G01F *11/00*

U.S. Cl. 222—256 **10 Claims**

1. A grease gun having a head cap containing a grease pump including a piston for pressurizing grease in a pressure chamber and communicating with a neck having a nozzle at the free end thereof, a pump lever linked to the head cap for operating the pump piston, a tubular body to which the head cap is fastened and which is adapted to contain grease, an end cap for closing the rear end of the tubular body, a plunger for urging the grease in the tubular body forward to fill the pressure chamber, a spring for urging the plunger forward, a plunger rod extending through a hole in the end cap, and a handle on the rear end of the rod, wherein the improvement comprises:

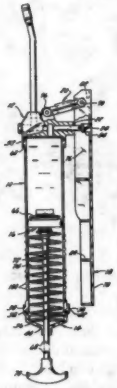
said tubular body comprised of a rear end having a lip and a front end having a lip;

a plurality of radially extending lugs on the outside surface of both ends of said tubular body;

a plurality of arcuate slots opening in the free edge of said end cap and said head cap, said slots being positioned to receive said lugs when said caps are placed on the ends of said tubular body with the open end of said slot in alignment with said lugs, said slots being curved to provide a blind end portion closer to the free edge of its respective cap than an intermediate portion of said slot between the open and blind end thereof;

internal means for exerting an axial force tending to separate said caps from said body such that said lugs will remain seated in said blind ends when said caps are turned onto the ends of said body with said lugs engaged in said slots;

said axial force exerting means at said ends of said body including a plurality of slots in said body to form a plurality of axially extending, circumferentially curved spring



fingers, and a portion of said end caps configured so as to matingly engage the lips of said body ends and cam said lips radially inward to resiliently flex said spring fingers which exert an outwardly directed force on said engaging portion of said end caps which resolves said force into an axial component and a radial component;

said rear lip of said body is configured on the outer corner thereof to provide a surface lying at about the same angle as said engaged portion of said end cap to facilitate the camming of said spring fingers when said end cap is lug-locked on; and

said slots each extending from the rear lip of said body to one of said lugs, respectively, and terminating in a rounded end adjacent to the rear edge of said lug.

4,601,413
SNAP-ACTING SPRING DEVICE

Alois Krawagna, Toronto, Canada, assignor to Creanova AG, Zurich, Switzerland

Filed Dec. 2, 1982, Ser. No. 446,484

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3147903

Int. Cl.⁴ F16K *31/56*

U.S. Cl. 222—498 **11 Claims**

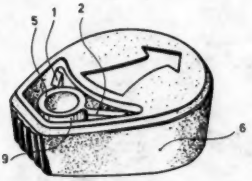
1. A bistable hinge arrangement in a one-piece plastic construction comprising:

a substantially cylindrical inner member having a cylindrical axis parallel to a longitudinal axis;

a substantially cylindrical outer member surrounding the inner member and having a cylindrical axis parallel to the longitudinal axis; and

springlike connecting means between the members so constructed as to establish an unstable dead center position of one member relative to the other member, a first stable position on one side of the dead center position, and a

second stable position on the other side of the dead center position, the connecting means comprising a plurality of springlike strips between the inner member and the outer member, each strip having an articulation groove where



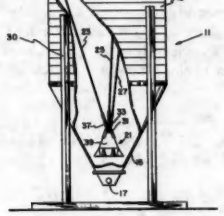
such strip joins the inner member and an articulation groove where such strip joins the outer member, the articulation grooves being parallel to the longitudinal axis and being adapted so maximum bending of the strips takes place at the articulation grooves.

4,601,414

SUSPENDED HOPPER BIN FLOW ENHANCER

John D. Lawson, R.R. #1, Box 83, Leesburg, Ind. 46538

Filed Mar. 21, 1984, Ser. No. 591,680
Int. Cl.⁴ B67D *3/00*
U.S. Cl. 222—564 **14 Claims**



1. A flow enhancement device formed as a one piece hollow geometrical shape for suspension within a material storage bin to reduce flow irregularities when material is allowed to drain from a lower region of the bin having a diverging upper portion for diverting downwardly moving material incident thereon radially outwardly as that material continues to move downwardly and having a lower portion including generally vertical side walls past which material may freely fall, means near the upper extremity of the upper portion for suspending the device with limited angular and swinging mobility, and a closable opening for the optional addition of ballast to the device hollow interior, and a plug for closing said closable opening for sealling the ballast therein.

4,601,415

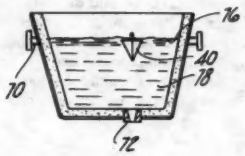
VORTEX INHIBITOR FOR MOLTEN METAL DISCHARGE

Robert J. Koffron, 31269 Verona Dr., Farmington Hills, Mich. 48018

Filed Sep. 21, 1984, Ser. No. 652,664
Int. Cl.⁴ B22D *41/10*
U.S. Cl. 222—597 **15 Claims**

1. In combination with molten metal receptacles wherein a layer of slag covers a layer of molten metal and having a discharge nozzle beneath the level of molten metal, the improvement comprising;

means for inhibiting the suction generated by the vortex formed above the discharge nozzle to prevent mixture of the slag with the molten metal being discharged through said discharge nozzle,



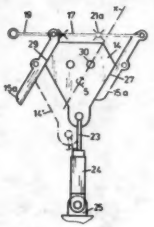
wherein said means comprises a polygonal body of refractory material tapered along its entire length and means for supporting said body at the interface of said layer of slag and layer of molten metal over said discharge nozzle whereby said body generally conforms with the shape of the vortex substantially along its entire length.

4,601,416

CLOSURE PLATE AND SLIDING CLOSURE UNIT

Bruno Schiltknecht, Richterswil; Gebhard Arnold, Lucerne; Otto Kägi, Cham; Robert Fricker, Unterägeri, and Beat Troxler, Hildisrieden, all of Switzerland, assignors to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Nov. 6, 1984, Ser. No. 668,823
Claims priority, application Switzerland, Nov. 18, 1983, 6201/83; Aug. 14, 1984, 03900/84
Int. Cl.⁴ B22D *41/08*
U.S. Cl. 222—600 **20 Claims**



1. In a sliding closure unit for discharging a molten material from a vessel and of the type including at least one stationary plate having therethrough a discharge opening, a movable plate mounted in sliding contact with said stationary plate, said movable plate having therethrough first and second discharge openings and including a closing area, and means for moving said movable plate between a closed position, whereat said closing area covers said discharge opening of said stationary plate, and alternate open positions, whereat one or the other of said discharge openings of said movable plate is aligned with said discharge opening of said stationary plate, the improvement wherein said moving means comprises:

guide means defining alternative first and second paths of movement of said movable plate in directions along respective first and second tracks extending between said closing area and said first and second discharge openings of said movable plate, respectively;

single drive means connected to said movable plate for moving said movable plate along a selected said path between said closed position and a selected said open position; and

said guide means being adjustable when said movable plate is in said closed position, without moving said movable

plate, to selectively switch between said first and second paths.

17. A closure plate for use as a movable plate in a sliding closure unit and comprising:

first and second discharge openings extending through said plate;

a closing area spaced from said discharge openings;

three rectilinear surfaces defining edges of said plate and relatively positioned to extend along the three sides of an imaginary equilateral triangle; and

centers of said first and second discharge openings being located on bisectors of respective angles of said triangle.

4,601,417

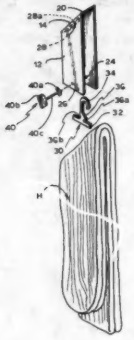
HOSIERY TAG

Steven J. Kunreuther, New York, N.Y., assignor to Kunreuther and Beringhause, Franklin Square, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,529

Int. Cl.[4] A41G *25/14*; B65D *13/00, 85/18*

U.S. Cl. 223—85 **1 Claim**



1. A tag for use in conjunction with hook means of the type having an enlarged base part and a hook part and with a fastener of the type having an elongated filament with enlarged ends, the tag being adapted to display vertically hanging hosiery folded along a line substantially inclined with respect to the horizontal, said tag comprising first and second side portions and an intermediate portion, each of said side portions having first and second edges, said second edges of said side portions being inclined with respect to said first edges thereof, said intermediate portion being articulately joined between said inclined second edges of said side portions, said side portions being adapted to be situated in spaced, substantially parallel relation with the hosiery therebetween, said intermediate portion having an opening therein adapted to receive the hook means with the base part thereof below said intermediate portion and the hook part thereof extending above said intermediate portion, fastener receiving openings in each of said side portions adapted to align with said side portions and situated in said relation such that a fastener can extend through said fastener receiving openings and the hosiery therebetween, said fastener receiving openings and said hook means receiving openings being substantially vertically aligned, the hosiery hanging substantially vertically with said intermediate portion extending at an incline with respect to the horizontal, in substantially parallel adjacent relation to the hosiery fold line.

4,601,418

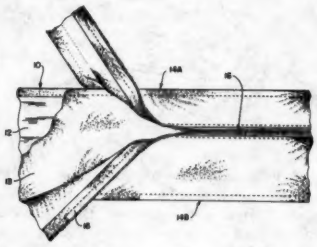
WRIST POCKET PROCESS

Terrell Gruzensky, 6520 Arizona Ave., Los Angeles, Calif. 90045

Filed Jul. 20, 1981, Ser. No. 284,695

Int. Cl.[4] A45C *1/06*

U.S. Cl. 224—222 **8 Claims**



1. A process for making an elongated flexible rectangular-shaped pocket to be worn on the arm or leg of the wearer, comprising the following steps: (a) providing a continuous strip of a selected flexible fabric to form a backing member for the pocket; (b) providing a continuous strip of a selected flexible fabric to form an inner member of the pocket; (c) providing a continuous strip of a zipper member; (d) attaching two continuous strips of a selected flexible fabric material on either side of the zipper member to form an outer member of the pocket; (e) placing the continuous backing member, the inner member and the outer member on top of one another and attaching the respective side edges of the members to one another; (f) cutting the resulting assembly to provide a plurality of units each of a predetermined length; (g) attaching a first Velcro member over one end of each of the units; and (h) attaching a second Velcro member to the other end of each of the units.

4,601,419

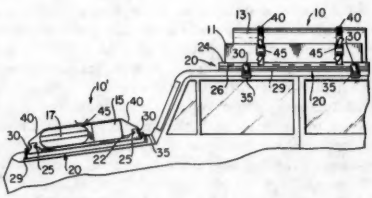
AUTOMOBILE ROOF-MOUNTED CARRIER

Henry B. Bird, Baptist Church Rd., Yorktown Heights, N.Y. 10598

Filed Jul. 29, 1985, Ser. No. 760,329

Int. Cl.[4] B60R *9/04*

U.S. Cl. 224—318 **12 Claims**



1. A vehicle carrier for supporting a load on a vehicle comprising:

a flexible mat with upper and lower surfaces, raised ridges being provided at least along the longitudinal sides of the upper surface of said mat, and adhering means being provided on its lower surface, the load being applied to the upper surface, the raised ridges defining a plurality of slots along the longitudinal sides of said mat, said slots extending completely through the raised ridges;

rigid retaining bars positioned along interior longitudinal portions of the raised ridges; and

at least one first tie strap on each opposite longitudinal side

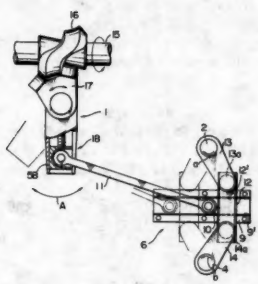
of said mat, one end of each of said first tie straps passing through one of the slots in opposite raised ridges and being connected to respective retaining bars and the other ends of said straps being adapted to be fastened to a portion of the vehicle.

4,601,420

ROLL FEED APPARATUS

Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,009
Int. Cl.[4] B65H *20/04*
U.S. Cl. 226—154 5 Claims



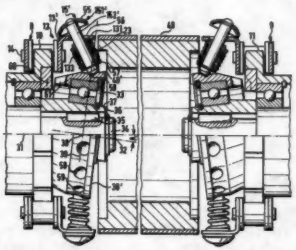
1. A roll feed apparatus comprising: an oscillation driving device; a first roll integrally mounted on a first roll shaft; a second roll integrally mounted on a second roll shaft extending in parallel with said first roll shaft and adapted for cooperation with said first roll in clamping therebetween a sheet-like blank material and feeding the same; a driving connection means drivingly connecting said oscillation driving means to said first and second rolls in such a manner that, when said first roll is oscillated in one direction by a predetermined amount, said second roll is oscillated in the opposite direction by the same amount; and a roll release device adapted to move said rolls away from each other when said rolls are oscillated in the counter directions thereby releasing said sheet-like blank material from the clamping force; wherein said driving connection means includes a first block fixed to the housing of said roll feed apparatus and having a first guide groove extending in the direction of feed of said sheet-like blank material in alignment with the path of feed, a slider slidably engaging said first guide groove, a connecting rod through which said oscillation driving device is connected to said slider, a second block integral with said slider and having a second guide groove which orthogonally crosses said first guide groove and extending in the direction of movement of said rolls caused by the operation of said roll release device, a first arm integrally fitted at its one end to said first roll shaft and provided at its other end with a rolling member which engages with said second guide groove, and a second arm integrally fitted at its one end to said second roll shaft and provided at its other end with a rolling member engaging with said second guide groove and arranged in symmetry with said first arm with respect to said path of feed of said sheet-like blank material.

4,601,421

FEEDING MEANS FOR FEEDING A MATERIAL WEB IN A PACKAGING MACHINE

Johann Natterer, Legau, and Ivo Ruzic, Kempten, both of Fed. Rep. of Germany, assignors to Multivac Sepp Haggenmuller KG, Fed. Rep. of Germany

Filed Apr. 2, 1984, Ser. No. 596,238
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315419
Int. Cl.[4] B65H *17/34*
U.S. Cl. 226—173 10 Claims



1. Feeding means for feeding a material web from an inlet side to an outlet side in a packaging machine, comprising feeding chains disposed on both sides of the web and sprocket wheels for guiding the feeding chains, each feeding chain having link chains and clamps connected thereto for gripping the edge of the material web, the clamps having a fixed clamping member connected with the associated chain link, a movable clamping member with a clamping jaw and a compression spring for biasing the movable clamping member into the closed position, and further comprising an engagement element for engaging the movable clamping member along a traveling section of the chain where the material web is to be gripped by or released from the clamps, the engagement element being designed as a slider supported slidably in axial direction of the sprocket wheel and engaging with a guiding means extending along the traveling section for guiding the engagement element with a varying distance from the plane of the sprocket wheel while the engagement element moves along the traveling section, whereby in a first portion of the traveling section the movable clamping member is lifted from the fixed clamping member in a substantially vertical direction and in a second portion of the traveling section following the first portion, the clamping jaw of the movable clamping member is additionally moved laterally from the edge of the material web to be gripped.

4,601,422

DEVICE FOR FORMING AND WELDING BLANKS IN SUPERPLASTIC MATERIAL

Guy Dumargue, Boulogne, and Jean L. Comercon, Le Vesinet, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Jun. 11, 1985, Ser. No. 743,517
Claims priority, application France, Jun. 19, 1984, 84 09572
Int. Cl.[4] B23K *37/00*
U.S. Cl. 228—44.3 8 Claims

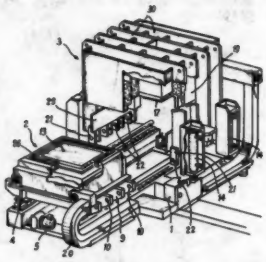
1. Device for forming and welding blanks in a material able to become superplastic comprising:

cooperating dies between which are placed the said blanks and which are respectively mounted on a lower frame and on an upper frame of said device, said upper frame being vertically movable between a position close to said lower frame and a position away from said lower frame,

heating means for bringing said blanks to the superplastic state.

means for applying a differential fluid pressure between the two faces of each of said blanks, and

means for isolating the working area of said blanks from the environment, said means comprising a peripheral wall integral with the upper frame, said wall surrounding the die carried by said upper frame and projecting downwardly with respect to said die, and a peripheral groove integral with the lower frame, said groove surrounding the die carried by said lower frame and containing a lower layer of a refractory powder and an upper layer of ceramic beads, said peripheral wall being adapted to penetrate said layers and to form a hermetic seal therewith.



4,601,423

ABRASIVE BODIES

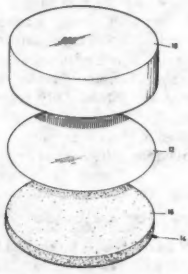
Noel J. Pipkin, 115 Pritchard Street, Johannesburg North, Randburg, Transvaal, and Trevor P. Elworthy, 5 Orpen Court, Viscount Avenue, Windsor Park, Transvaal, both of South Africa

Filed Sep. 16, 1983, Ser. No. 533,262

Claims priority, application South Africa, Sep. 16, 1982, 82/6798

Int. Cl.[4] B23K *1/20*

U.S. Cl. 228—121 **11 Claims**



1. A method of bonding a cubic boron nitride compact to a cemented carbide support, the cubic boron nitride compact comprising a polycrystalline mass of cubic boron nitride particles, present in an amount of at least 70 percent by volume, bonded into a hard conglomerate, including the steps of metallising a surface of a cubic boron nitride compact by bonding a layer of gold, silver or a gold- or silver-based alloy to that surface and bonding the metallised surface to a surface of a cemented carbide support through a braze alloy having a liquidus temperature above 700° C., wherein said braze alloy contains at least 40% by weight silver, gold or a combination thereof and 1 to 10% by weight of an active metal selected from the group of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium and molybdenum.

4,601,424

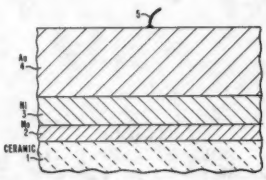
STRIPPED GOLD PLATING PROCESS

Avinash S. Adwalpalker, Stormville; Joseph M. Harvilchuck, Billings; Joseph R. Ranalli, Fishkill, and David W. Rich, Middletown, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1985, Ser. No. 735,040

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—124 **8 Claims**



1. The process comprising

depositing nickel on a substrate,

forming a thin layer of gold over said nickel,

chemically stripping said gold layer,

depositing thick gold over said nickel, and

diffusing said thick gold into said nickel.

4,601,425

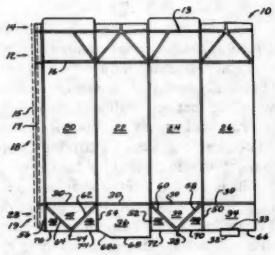
NONWICKING BOTTOM CLOSURE FOR A LIQUID-TIGHT CONTAINER

Larry G. Bachner, Barrington, Ill., assignor to Nimco Corporation, Crystal Lake, Ill.

Filed Feb. 29, 1984, Ser. No. 584,869

Int. Cl.[4] B65D *5/72*

U.S. Cl. 229—17 G **17 Claims**



1. In a blank of foldable sheet material for a container having top closure panels, tabs, and fold lines for creating a liquid tight closure and first, second, third and fourth wall panels, said wall panels being joined by fold lines along their respective top edges to said top closure panels and tabs and said wall panels being arranged side by side, each joined along a fold line to the panels adjacent to it, one of the wall panels having a side seam sealing arrangement, said wall panels being joined along fold lines at their respective bottom edges to an improved bottom panel arrangement comprising in combination:

first and second end panels each having first, second, third and fourth edges, said first and second end panels being connected along their third edges by fold lines respectively to the bottom edges of said second and fourth wall panels, each of said first and second end panels having a triangular end tab and first and second triangular fold-in tabs, each of said first and second triangular fold-in tabs being connected along a fold line to said triangular end tab;

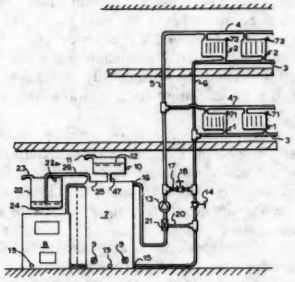
first and second bottom panels having first, second, third and fourth edges, said first and second bottom panels being connected along their third edges by fold lines respectively to the bottom edges of said first and third wall panels, said first bottom panel being connected along its fourth edge by a fold line to the second edge of said first end panel, said second bottom panel being connected along its second edge by a fold line to the fourth edge of said first end panel and along its fourth edge by a fold line to the second edge of said second end panel, the length of said second bottom panel measured between its first and third edges being longer than the length of said first bottom panel measured between its first and third edges; and an extension tab having an inner edge and an outer edge, said extension tab being connected along its inner edge by a fold line to the first edge of said first bottom panel, said extension tab being narrower in width than the distance between said second and fourth edges of said first bottom panel, and said extension tab protruding out from the first edge of said first bottom panel such that the portion of the first edge of said first bottom panel on either side of said extension tab is closer to said wall panels than the outer edge of said extension tab.

4,601,426

EXCESS-PRESSURE-FREE BOILER AND ACCUMULATOR HEATING SYSTEM

K. Hilding Brosenius, Hazeliusbacken 16, Stockholm, Sweden (115 21)

Filed Jan. 22, 1985, Ser. No. 693,141
Claims priority, application Sweden, Jan. 27, 1984, 8400415
Int. Cl.[4] F24D *3/00*
U.S. Cl. 237—59 **6 Claims**



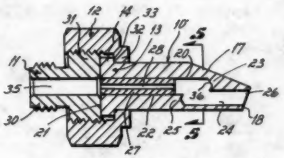
1. A hot water heating system for heating of one-family-houses with at most two floors above a cellar, comprising a plurality of water-radiators with belonging riser- and return-pipes and branch-pipes to the radiators, a source of hot water, expansion vessel which has an unbroken water-connection to both radiators and heat source and a circulation pump, wherein the expansion vessel is arranged on a lower level than the radiators and situated immediately above or beside the top of the heat source and therefore causing only an insignificant or neglectible excess-pressure on boiler or accumulators and wherein the expansion vessel on said level is provided with an open outlet to the atmospheric air without that the water from the radiators on a higher level, which water has free water connection to the expansion vessel, escapes through said open outlet and wherein at the same time the radiators and belonging pipes are exposed to a large excess-water pressure corresponding to the level in the system of said parts and wherein last mentioned excess water-pressure is caused by a circulation pump, which is arranged downwards in the riser pipe of the system and which is working in combination with a flow-resistance means which is arranged downwards in the return-pipe of the system and whereby said pump in combination with said flow-resistance means continuously can move the circulation water from an essentially pressure-free heat source to permanently pressure-exposed radiators also at the topmost floor.

4,601,427

ADHESIVE DISPENSING NOZZLE

Larry C. Trevathan, Westlake, Ohio, and Jerry R. Farmer, Suwanee, Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Aug. 23, 1984, Ser. No. 643,842
Int. Cl.[4] B05B *1/34*
U.S. Cl. 239—11 **6 Claims**



1. A nozzle for dispensing a solution of liquid and gas, from which solution the gas is released to form a foam upon said solution emerging from said nozzle, which nozzle comprises,

an inlet opening and a discharge orifice,

a liquid flow passage extending between said inlet opening and said discharge orifice, said liquid flow passage comprising,

a first longitudinally extending small diameter bore in fluid communication with said inlet opening,

a second bore colinearly aligned with said first bore and in fluid communication with said first bore, said second bore being substantially larger in diameter than said first bore,

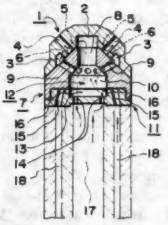
a third longitudinally extending bore in fluid communication with said discharge orifice, said third bore being generally parallel to said second bore and intersecting said second bore but being laterally offset from said second bore.

4,601,428

BURNER TIP

Haruji Kurogo, Tokyo, Japan, assignor to Tokyo Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 677,946
Claims priority, application Japan, Dec. 9, 1983, 58-231436
Int. Cl.[4] B05B *7/06*
U.S. Cl. 239—427.3 **5 Claims**



1. A burner tip comprising a tapered body having a hollow interior provided with a central recess and a circular groove spaced outside said recess, said tapered body having a number of jetting ports opening on the outer peripheral surface between the central recess and the circular groove and a first set of communicating grooves extending respectively between said jet ports and said recess and a second set of communicat-

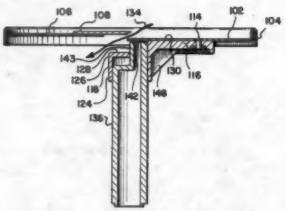
ing grooves extending between said jet ports and said circular recessed groove, a flow dividing body having a hollow interior defining a mixing chamber and an exterior taper to fit within said body and provided with holes for feeding a gaseous mixture from said mixing chamber respectively to the recess and circular groove in said body.

4,601,429

CONCENTRIC DRIVE FOR FOOD PROCESSING TOOL

Richard L. Stottmann, Troy; Edward F. Ponikwia, Dayton, and William Weigl, Troy, all of Ohio, assignors to KitchenAid, Inc., St. Joseph, Mich.

Filed May 31, 1985, Ser. No. 739,725
Int. Cl.[4] B02C *18/18*
U.S. Cl. 241—92 **6 Claims**



1. In a food processor having a drive motor, a working bowl, a drive shaft projecting upwardly from said drive motor through said bowl for rotation of a food processing tool within said bowl, a bowl cover detachably secured to said bowl, and a feed tube extending substantially to the center of said drive shaft for introducing food items into contact with said food processing tool and hence into said bowl, a food processing tool comprising:

a removable food processing head comprising:

a disk-like member having cutting means for performing a desired food processing operation on food items in contact with said cutting means as said disk-like member is rotated;

a mounting hub having a drive-receiving opening extending entirely through said hub from a lower end to an upper end, the remain ing portion of said upper end being closed; and

a disk-mounting flange integral with the mounting hub which extends axially and radially primarily from the open portion of the upper end of said hub and defining an upper surface for essentially flush engagement with said disk-like member, said disk-mounting flange being secured to said disk-like member in an orientation to present minimal interference between said cutting means and said hub and mounting flange and, in particular, such that said hub is concentric with said disk-like member and the closed portion of the upper end of said hub extends to substantially the center of said disk-like member and is spaced therefrom by the axial dimension of said disk-mounting flange to permit said cutting means to extend substantially to the center of said disk-like member and to overlay the closed portion of the upper end of said hub; and

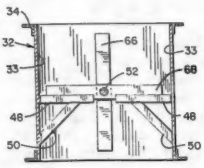
a drive extension having a lower end removably engageable with said drive shaft to be driven thereby and an upper end formed to be slidingly received within said hub and defining a drive member received within said drive-receiving opening and extending substantially to the upper surface of said disk-mounting flange, said drive extension being concentric with said drive shaft and said disk-like member.

4,601,430

ASH GRINDER FOR SCRUBBER SYSTEM

Michael F. Skinner, Blaine, Minn., assignor to Northern States Power Company, Minneapolis, Minn.

Filed May 10, 1984, Ser. No. 608,779
Int. Cl.[4] B02C *18/08*
U.S. Cl. 241—101.2 **4 Claims**



1. In combination with the flue gas scrubber system of a power plant having a scrubber chamber with a lower portion converging to an outlet, an ash grinder for mounting in the outlet of the scrubber chamber, comprising:

a vertical, open throat section of rectangular cross-section having upper and lower ends;

mounting flanges secured about the upper and lower ends of said throat section;

a generally horizontal shaft extending through said throat section between said mounting flanges, said shaft having opposite ends positioned outside of said throat section;

a pair of support pedestals, each pedestal being secured to the outside of said throat section beneath an end of said shaft;

a bearing mounted on each support pedestal for rotatably journalling the associated end of said shaft;

a stuffing box connected between each end of said shaft and the associated side of said throat section;

a plurality of substantially perpendicular pairs of straight first blades mounted in substantially uniform spaced-apart relationship on said shaft for rotation within said throat section;

a plurality of opposite pairs of straight second blades mounted in substantially uniform spaced-apart relationship on the inside of said throat section and extending between the pairs of first blades on said shaft, said second blades having upper edges lying generally in a common horizontal plane;

said shaft being rotatable about a generally horizontal axis positioned between the said common horizontal plane and the upper end of said throat section to effect a shearing action between said first and second blades; and

brace members for reinforcing said second blades, said brace members being angled toward the lower end of said throat section;

a driven sprocket secured to one end of said shaft;

a drive sprocket;

a chain interconnecting said drive and driven sprockets; and

a reversible drive motor coupled to said drive sprocket for effecting rotation of said shaft and said first blades to reduce any large ash chunks falling into said throat section from the scrubber chamber.

4,601,431

TRAVELING MAGNETIC FIELD TYPE CRUSHER

Yasuo Watanabe; Takeo Takahashi, and Keiji Haga, all of Kanagawa, Japan, assignors to Fuji Electric Company, Ltd., Japan

Filed Sep. 13, 1982, Ser. No. 417,204
Int. Cl.[4] B02C *17/18*
U.S. Cl. 241—172 **12 Claims**

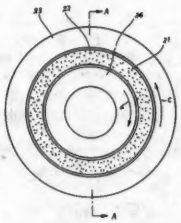
1. A traveling magnetic field-type apparatus for processing loose material with working substances comprising:

an elongated container having two generally parallel op-

posed side surfaces and containing working substances and a quantity of loose material to be processed;

first traveling magnetic field generating means adjacent to one side surface of said container for generating a linearly traveling magnetic field; and

second traveling magnetic field generating means adjacent to the other side surface of said container for generating a linearly traveling magnetic field;



wherein said first and second traveling magnetic field generating means generate corresponding magnetic fields at the opposite side surfaces of the container which travel in opposite linear directions with respect to each other and interact on the working substances within the container, thereby imparting random motion to said working susbtances to cause them to process the loose material throughout the container.

4,601,432

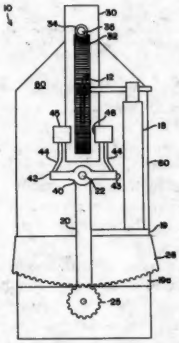
METHOD FOR WINDING WIRE COILS ON A TOOTHED STACK

Richard D. Sedgewick, 100 Horne St., Dover, N.H. 03820

Division of Ser. No. 424,502, Sep. 27, 1982, Pat. No. 4,538,770. This application May 6, 1985, Ser. No. 730,991

Int. Cl.[4] H02K *15/085*

U.S. Cl. 242—7.03 **5 Claims**



1. A method of winding wire around selected teeth of a toothed or slotted stack or core having at least a row of teeth arranged in a row defining two sides along the row using wire feed winding guide means comprising:

operatively mounting pliant bearing surface clamp means for movement toward and away from said row of teeth on either side of the row of teeth between a clamp position and an open position in which clamp position the pliant bearing surface of said clamp means bears against a portion of one side of the the row teeth conforming to the surface of any winding already formed around selected teeth whereby the winding wire is held in place while the winding guide means moves relative to said stack;

clamping the wire alternately against one side of the row of teeth and then the other side using said pliant bearing surface clamp means in the clamp position while moving the winding guide means up and down between the bottom and top of the teeth of the row of teeth and back and forth from one side of the row of teeth to the other side over the row of teeth in first and second coordinate axis directions, thereby seating the wire in slots between teeth of the stack;

and alternatively unclamping the wire by releasing said pliant bearing surface clamp means from either side of the row of teeth to the open position while moving the stack and row of teeth relative to the winding guide means in a third coordinate axis direction to differenct slot and teeth locations of the stack.

4,601,433

TOROIDAL CORE WINDING APPARATUS

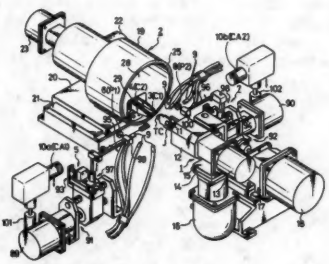
Tsuneyuki Hayashi; Manabu Yamauchi; Kazuhide Tago, all of Tokyo; Toshio Konishi, Kanagawa, and Shinji Hirai, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1984, Ser. No. 632,962

Claims priority, application Japan, Jul. 23, 1983, 58-134810

Int. Cl.[4] H01F *41/08*

U.S. Cl. 242—4 R **6 Claims**



1. An apparatus for winding a wire around a toroidal core comprising:

a core holding means for supporting a toroidal core, moving the same in the directions of first and second axes and rotating the same;

first and second clamp means for clamping one end of a wire;

a clamp driving means for holding said first and second clamp means and moving the position thereof in the directions of said first and second axes and rotating the same;

a wire holding means positioned near said toroidal core for supporting said wire;

a detector means for detecting the position of said wire and the aperture of said toroidal core; and

a control means for controlling said core holding means and said clamp driving means by the output from said detector means.

4,601,434

PACKAGE TRANSPORTING APPARATUS

Shigeki Mori, Ohtsu; Akihiro Itoi, and Yoshiyuki Ichiba, both of Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed May 1, 1984, Ser. No. 605,787

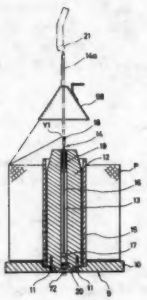
Claims priority, application Japan, May 3, 1983, 58-78587

Int. Cl.[4] B65H *49/00, 67/02, 67/06*

U.S. Cl. 242—35.5 A **3 Claims**

1. A package transporting apparatus characterized in that a peg tray for independently fitting and supporting thereon a package to be transported on which a spun yarn is wound comprises a base plate, a peg extending erectly from the center of and secured to the base plate, and a yarn guide inserted for

movement in a center hole of the peg said yarn guide having a yarn grip provided at an upper end thereof so that said peg tray



may be transported with an end of a yarn on the package secured to said yarn grip.

4,601,435

WINDER ARRANGEMENT

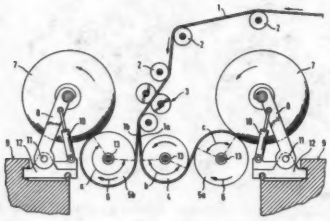
Kauko Tomma, Helsinki, and Jarmo Malmi, Järvenpää both of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Jun. 25, 1984, Ser. No. 623,952

Claims priority, application Finland, Jul. 7, 1983, 832497

Int. Cl.[4] B65H *18/16, 35/02, 18/10*

U.S. Cl. 242—56.4 **13 Claims**



1. Winder apparatus for forming rolls from a running web by slitting the web longitudinally into at least first and second web portions and winding the web portions into an equal number of rolls, the winder apparatus comprising at least first and second winders for receiving the first and second web portions respectively, and each winder comprising first and second means for supporting the weight of a roll at its center and at its periphery respectively, whereby a central support force and a peripheral support force are provided for the roll, the center of the roll moving away from the second means as the winding progresses and the roll becomes larger, and each winder also comprising means for guiding movement of the center of the roll away from the second means in a direction such that the ratio of the peripheral support force and the central support force undergoes a substantial change during such movement, said peripheral support force being at least as large as the central support during the initial phase of the winding and the central support force being substantially larger than the peripheral support force during the final phase of the winding, the second means of each winder comprising a roll support drum and the winder apparatus comprising an auxiliary web leading drum associated with the second winder, and means for leading the first web portion over the roll support drum of the first winder and the second web portion over both the auxiliary drum and the roll support drum of the second winder so that the first and second web portions are wound into the respective rolls in the same rotation direction, the web contact angle between the first web portion and the roll support drum of the first winder being substantially equal to the sum of the web contact angles between the second web portion and the auxiliary drum and between the second web portion and the roll support drum of the second winder.

4,601,436

APPARATUS FOR WINDING AND UNWINDING FLEXIBLE FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, ARRIVING CONTINUOUSLY, ESPECIALLY IN IMBRICATED FORMATION

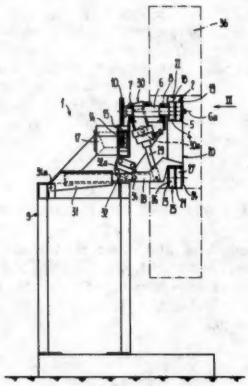
Werner Honegger, Tann-Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Apr. 29, 1985, Ser. No. 728,219

Claims priority, application Switzerland, May 9, 1984, 2267/84

Int. Cl.[4] B65H *18/04*

U.S. Cl. 242—59 **8 Claims**



1. An apparatus for winding flexible, substantially flat products, especially printed products, arriving continuously, especially in imbricated formation, together with a winding strap into a wound package and for unwinding the same from such a wound package, comprising:

a substantially hollow and substantially cylindrical winding core drivable in a winding procedure;

a support arrangement for rotatably and releasably supporting said winding core;

said winding core being constructed as an annular friction wheel of a friction wheel drive arrangement;

said annular friction wheel being structured for deposition upon and lifting from said support arrangement;

said annular friction wheel having an inner side and a longitudinal axis;

said annular friction wheel containing at said inner side a traction surface coaxial with said longitudinal axis;

said annular friction wheel comprising side flanges extending inwardly towards said longitudinal axis for laterally delimiting said traction surface;

said support arrangement comprising rotatable support wheels;

said traction surface bearing upon said rotatable support wheels;

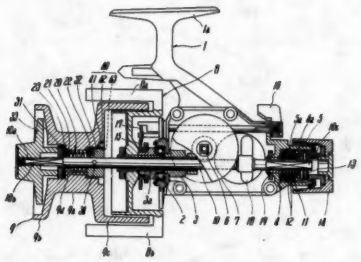
drive means for driving said rotatable support wheels in the winding procedure; and

said rotatable support wheels being constructed as friction wheels of said friction wheel drive arrangement.

4,601,437
SPINNING REEL

Osamu Yoshikawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 17, 1984, Ser. No. 631,757
Claims priority, application Japan, Jul. 21, 1983, 58-133800; Jul. 29, 1983, 58-119590[U]
Int. Cl.⁴ A01K *89/01, 89/02*
U.S. Cl. 242—84.5 A **6 Claims**

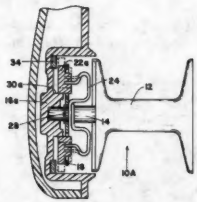


1. A spinning reel, comprising a reel body, a spool, said spool being rotatably supported with respect to said reel body, a rotary frame rotatably supported to said reel body, for winding a fishing line onto said spool during rotation of said rotary frame relative to said reel body, a first member rotatably mounted relative to said reel body, coupling means for coupling said first member and said spool to each other such that said spool is rotatable relative to said first member for at least a partial revolution relative thereto, resistance means for applying a rotational resistance to said first member and to said spool against rotation of said first member and said spool relative to said reel body to enable interruption of rotation of said spool relative to said reel body, and elastic shock absorber means disposed between said spool and said first member to absorb a shock caused by an excessive pull action on said line greater than a predetermined durability of said line in a condition in which an excessive resistance greater than the predetermined durability of said line is applied by said resistance means against rotation of said spool, wherein said coupling means includes regulation means for stopping relative rotation between said first member and said spool at an end of said at least a partial revolution to cause said first member and said spool shaft to be rotatable with each other to regulate a range of rotation of said spool with respect to said first member.

4,601,438
BAIT CASTING REEL WITH BRAKING DEVICE

John N. Young, Fairfax, Calif., assignor to Charles C. Worth Corporation, Kentfield, Calif.

Filed Apr. 29, 1985, Ser. No. 728,097
Int. Cl.⁴ A01K *89/02*
U.S. Cl. 242—84.52 C **4 Claims**

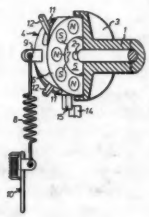


1. In a rotating spool casting reel including:
a body;
a shaft rotatable in said body; and
a spool fixed on said shaft to rotate therewith;
the improvement comprising:
a carrier fixed on said shaft to rotate therewith;
at least one block radially movable on said carrier;
an inner, cylindrical brake surface slidably engagable by each said block;
spring means biasing each said block radially inward toward said inner brake surface;
said spring means being opposed by centrifugal force when said shaft and carrier are rotating; and
interacting braking media on each of said blocks and on said body operative to apply an increased retardation force to movement of said blocks when said carrier is rotated;
one of said media comprising a magnet and the other of said media comprising an electrically conductive material.

4,601,439
MAGNETIC BRAKE FOR A FISHING REEL

Börje S. Moosberg, Mörrum, Sweden, assignor to ABU Aktiebolag, Svangsta, Sweden

Filed Jun. 4, 1985, Ser. No. 741,165
Claims priority, application Sweden, Jun. 5, 1984, 8403016
Int. Cl.⁴ A01K *89/02*
U.S. Cl. 242—84.52 B **3 Claims**



3. A fishing reel comprising a frame, a line spool rotatably mounted in the frame, a magnetic brake including a plurality of permanent magnets, magnet supporting means to support said magnets, means to movably mount said magnet supporting means for movement in said frame, and a rotary surface including magnetically activable material and connected to be rotated by said line spool when said line spool is rotated, said magnets having pole ends facing said surface in such spaced relationship thereto that the magnetic field therebetween is capable of inducing eddy current therein when said line spool with said surface is rotated, thereby to effect a braking torque on the rotating line spool via said surface, the force of said braking torque being related to the strength of said magnetic field and to the distance between said pole ends and said surface, said supporting means being movable by said means to movably mount said magnetic supporting means for movement in relation to said surface between first and second end positions, said pole ends in said first and second end positions of said supporting means being positioned, respectively, at a predetermined minimum and a predetermined maximum distance from said surface, and said magnetic brake further comprising guide means for guiding said magnet supporting means between said end positions in combination with rotational movement, and spring biasing means connected to said magnet supporting means and tending to rotate and thereby to move said magnetic supporting means in one direction to one of said first and second positions, the counter-electromotive force induced in said surface when the latter, together with the line spool, is rotated tending to rotate and thereby to move said magnet supporting means in the opposite direction against the action of said biasing means, whereby the actual position of said magnet supporting means between said first and second end positions and, hence, the braking effect of said magnetic

brake on said line spool are automatically adjusted in dependence upon the speed of rotation of the line spool, said magnetic brake comprising an adjusting means for adjusting the bias of said spring biasing means, said adjusting means comprising operating means mounted to be accessible from the outer side of the fishing reel.

4,601,440

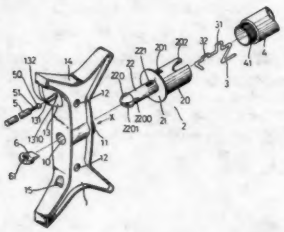
LINE EXTENDER AND REWINDER FOR KITE

Kun-Meng Wang, No. 57, Lane 50, Chung Cheng Rd., Pei Hsin Ts'un, Tai Pao Hsiang, Chia-I, Taiwan

Filed Jul. 18, 1985, Ser. No. 756,200

Int. Cl.[4] B65H *75/40*; B64C *31/06*

U.S. Cl. 242—96 **1 Claim**



1. A line extender and rewinder for a kite comprising an X-like plastic main body having a passing hole in the middle, a flange being disposed around an end of the passing hole, a toothed slot formed in the flange, two holes respectively formed at the upper and lower sides of the main body for line tying, a segment disposed at the opposite side of the flange, a long groove formed at the middle of the segment, a hole formed at an end of the groove and a curved groove located at another side of the segment, two line winding seats of which one is formed at the upper side of the main body and the other at the lower side thereof and a recession formed at the bottom of the main body:

a connector in the form of a syringe, having a hollow post at one end, a moving rod at another end, and a ring in the middle, a recession disposed at the hollow post near the ring, an inner threaded surface formed at another end of the hollow post, two semiconical blocks formed at one end of the moving rod, a recession formed at the inner edge of each block and a v-slot formed between the blocks to be capable of inserting the moving rod into the passing hole of the main body, and a recession formed at the moving rod near the ring;

a spring leaf, made of bent steel wire, having two protuberances, of which the smaller protuberance can pass through the recession of the moving rod and held within the toothed slot of the main body, and the larger protuberance can be held within the recession of the hollow post;

a jacket with threads at one end for connecting to the threaded surface of the hollow post of the connector;

a column with one end being held within the recession at bottom of the main body, said column provided at another end with a ball which can be inserted into the hole at the main body so that the column is moveable along the curved groove; and

a wedge block with a tenon at the upper side and another tenon at the lower side for respectively inserting into the recessions of the semiconical blocks while the wedge block is inserted into v-slot between the blocks at the moving rod so that the moving rod will not disengage from the passing hole of the main body after passing through the passing hole thereof.

4,601,441

ARRANGEMENT FOR WEB WINDING

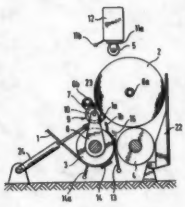
Hannu Oinonen, and Jyrki Jääskeläinen, both of Järvenpää, Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

Filed May 9, 1984, Ser. No. 608,358

Claims priority, application Finland, May 12, 1983, 831671

Int. Cl.[4] B65H *19/20*

U.S. Cl. 242—56 R **40 Claims**



1. Apparatus for winding a web onto a roll take-up member, comprising first and second support drums defining a web winding position therebetween, means defining a receiving position for a complete roll, said second support drum being between the first support drum and the receiving position, means for transferring the complete roll over the second support drum from the winding position to the receiving position, a web cutter for severing the web when a roll has been completed, and means for supplying a new roll take-up member into the winding position by downwards motion under the influence of gravity, the transfer means, the web cutter and the supply means being mechanically connected together so that when a roll has been completed and the transfer means are actuated, the following operations occur, in the order stated, (a) the transfer means displace the complete roll from the winding position in the direction towards the receiving position, (b) the web cutter severs the web to form new leading and trailing ends of the web, and (c) the supply means supply a new roll take-up member into the winding position, and the apparatus further comprising guide devices and retainer devices for controlling movement of the leading end of the web after severing, said guide devices guiding the new leading end of the web into a position in which it contacts the first support drum, so that when the new roll take-up member is received in the winding position the new leading end of the web is between the new roll take-up member and the first support drum, and said retainer devices being separate from the first drum and generating a force directed against the first drum.

4,601,442

MISSILE WITH HIGHLY BACKSWEPT WING UNIT, IN PARTICULAR WITH DELTA WINGS

Franz Friedel, Oberteuringen; Werner Frühauf, Bermatingen; Günter Harms, Friedrichshafen; Georg Heise, Immenstaad, and Heinrich Lükewille, Salem, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 25, 1983, Ser. No. 545,083

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240903

Int. Cl.[4] F42B *15/02*

U.S. Cl. 244—3.24 **18 Claims**

1. A missile for unmanned flight to a target from a launching point, comprising:

(a) a fuselage having a longitudinal axis defining a roll axis of said missile;

(b) a pair of delta wings connected to said fuselage, the junction of each of said delta wings with said fuselage defining a wing root and the portion of each of said delta wings furthest from said fuselage forming a wing tip, each of said delta wings having a front edge and a back edge

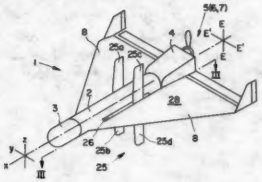
extending from said wing tip to said wing root, and each of said delta wings having a storage space formed therein in the vicinity of said wing root;

(c) a pair of ailerons rotatably connected to the respective back edges of said delta wings;

(d) a pair of fins connected to the respective wing tips of said delta wings and having rotatable rudders thereon;

(e) a homing device mounted in the front of said fuselage for controlling said ailerons and rudders in dependence on the position of said missile relative to said target; and

(f) a first pair of lateral stabilizers rotatably mounted in one



of said storage spaces and a second pair of lateral stabilizers rotatably mounted in the other of said storage spaces, each of said stabilizers having a retracted position in which the stabilizer is inserted in said corresponding storage space and an extended position in which the stabilizer is oriented substantially perpendicular to said corresponding delta wing, the first stabilizer of each pair extending below said delta wings in its extended position and the second stabilizer of each pair extending above said delta wings in its extended position, said stabilizers being adapted to stabilize said missile about said roll axis when extended.

4,601,443

FREE FLYABLE STRUCTURE

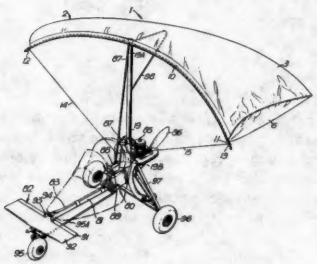
Andrew W. Jones, September Cottage, High Street, Brinkley, Cambridge, and Raymond Merry, 18 Orkney Close, Haverhill, Suffolk, CB9 OLS, both of United Kingdom

PCT No. PCT/GB83/00242, § 371 Date May 23, 1984, § 102(e) Date May 23, 1984, PCT Pub. No. WO84/01346, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 28, 1983, Ser. No. 617,091

Int. Cl.[4] B64C *3/42*

U.S. Cl. 244—13 **9 Claims**



1. A flyable structure comprising: wing formation including an air inflatable elongate container having a leading edge region and a trailing edge region, the container being of such form that when inflated it provides an airfoil cross-section whereby relative displacement between the container and surrounding air produces aerodynamic lift; elongate means for supporting and maintaining the leading edge region in an extended condition while leaving the trailing edge region unsupported; a king-post arrangement for supporting a load below the wing formation, the king-post arrangement having a lower end to which the load is connected and an upper end connected to the center of the elongate means and thus the leading edge region of the wing formation by way of a pivotal connection which allows for relative tilt between the wing formation and the king-post arrangement; and means for controlling the flight path of the structure by producing relative tilting movement between the wing formation and the king-post arrangement, the flight path control means including control connections co-operating with the opposite ends of the leading edge region of the wing formation, and control connection adjustment means for selectively varying the relative positions of the ends of the leading edge regions relative to the load for the purpose of producing said relative tilt, the control connection adjustment means being mounted to the structure at a location spaced downwardly of the pivotal connection.

4,601,444

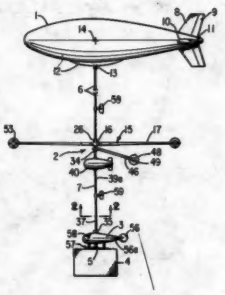
AERIAL LOAD-LIFTING SYSTEM

Bernard Lindenbaum, 4929 Thorain Ct., Dayton, Ohio 45416

Filed Jun. 8, 1983, Ser. No. 502,324

Int. Cl.[4] B64B *1/30*

U.S. Cl. 244—26 **9 Claims**



1. An aerial load-lifting system having a plurality of aircraft units, one of said units comprising a lighter-than-air aircraft and another unit comprising a powered heavier-than-air aircraft, a first flexible tension member interconnecting said units, a second flexible tension member connected to and dependent from said heavier-than-air aircraft, said heavier-than-air aircraft being a vertical takeoff and landing type airplane having a pair of laterally disposed prop-rotors interconnected by a rigid member, a connecting member interconnecting said flexible tension members, and said rigid member pivotally connected to said connecting member permitting tilting of said aircraft about a horizontal axis.

4,601,445

DEVICE FOR RAPID FIXING AND REMOVAL OF A LOADER TO AND FROM AN AIRCRAFT CARRYING DEVICE

Didier A. Duclos, Maison Alfort, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Dec. 27, 1984, Ser. No. 686,820

Claims priority, application France, Jan. 10, 1984, 84 00267

Int. Cl.[4] B64D *1/02*

U.S. Cl. 244—137 A **7 Claims**

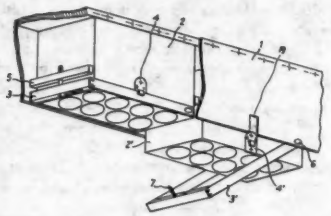
1. A device for rapid positioning and removal of a loader in and from an aircraft carrying device, which comprises:

a horse shoe shaped lever consisting of:

a pair of parallel side legs adapted to support the loader and which are pivotably mounted at one end on the carrying device,

a cross leg interconnecting said side legs at their opposite ends,

a single fixing screw carried by said cross leg and adapted to co-act with the carrying device for ensuring a final securing of the loader, and



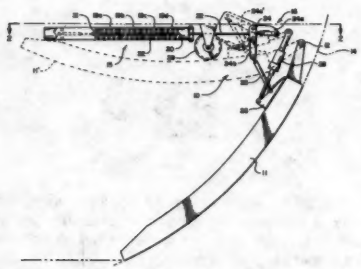
means carried by said loader and adapted to co-act with a flat bolt housed in the thickness of the bottom of the carrying device for ensuring an automatic previous latching of the loader to the carrying device.

4,601,446

AIRCRAFT DOOR COUNTERBALANCE SYSTEM

Allan W. Opsahl, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1983, Ser. No. 537,727
Int. Cl.[4] B64C *1/14*
U.S. Cl. 244—129.5 **14 Claims**



1. In combination with an aircraft having a structural support frame defining an overhead compartment support frame, a fuselage defining an ingress/egress opening, and a door pivotally connected to said aircraft structural support frame adjacent its upper horizontal edge and adapted to be shifted inwardly and upwardly about said horizontal pivot axis towards said overhead structural support frame during door opening and to be shifted downwardly and outwardly about said axis towards said ingress/egress opening during door closure, an improved door counterbalancing system comprising:

(a) means defining a spring assembly secured to said overhead structural support frame, said spring assembly including a housing, a spring actuator mounted in said housing with freedom for movement axially therethrough, and axially compressible spring defining means mounted within said housing having one end bottomed on said actuator and the other end bottomed on said housing;

(b) a bell crank pivotally secured to said overhead structural support frame, said bell crank having first and second angularly related crank arms;

(c) a control link having one end secured to said aircraft door and its opposite end secured to one of said first and second angularly related crank arms; and,

(d) means defining a cable coupled at one end to said spring actuator and extending through said axially compressible spring defining means and said spring housing, said cable defining means having its free end coupled to the other of said first and second angularly related crank arms;

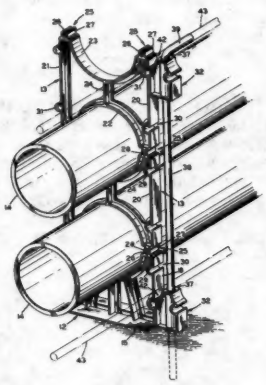
said spring assembly, bell crank and control link being oriented relative to one another and relative to said door and said structural frame such that when said door is closed, said axially compressible spring defining means are fully compressed and energy is stored therein, and so that upon inward and upward pivotal movement of said door about said horizontal pivot axis, said control link causes said bell crank to rotate and reduces the distance between the connection of said cable defining means to the other of said first and second angularly related crank arms and said spring housing, permitting said fully compressed spring defining means to expand and expending the energy stored therein to counterbalance the increasing hinge moment attributable to the weight of said door as it is shifted inwardly and upwardly about said pivot axis.

4,601,447

CONDUIT SPACER ANCHORING SYSTEM

James H. McFarland, Leonard, Mich., assignor to LOF Plastics Inc., Troy, Mich.

Filed Oct. 29, 1984, Ser. No. 665,968
Int. Cl.[4] F16L *3/22*
U.S. Cl. 248—49 **13 Claims**

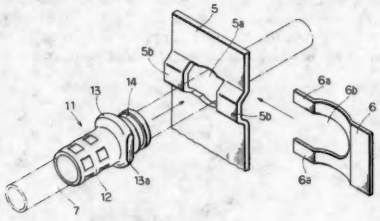


1. A system for anchoring a utility duct bank within a trench comprising a framework of interlocked modular spacer units clampingly engaging therein at least one conduit member, each said modular unit having a pair of opposite side members, mating connectors on said opposite side members for laterally interconnecting a plurality of said modular units, a box-like holder of generally rectangular configuration relatively smaller than said modular units and having opposite side walls and planar top and bottom walls, connectors on said side walls adapted to interfit with said mating connectors on said side members for securing said holder to either side of said modular units, said holder extending outwardly beyond the side member of the modular unit to which it is secured, means defining a tubular opening extending entirely through said box-like holder along the longitudinal axis thereof, a rod-like member extending through said tubular opening in said holder and into the earth in the floor of said trench, and means preventing said holder from moving upwardly along said rod-like member.

4,601,448
HOSE MIDWAY HOLDER

Takeshi Miyazaki, Inazawa, and Kenji Sugiyama, Gifu, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 20, 1984, Ser. No. 632,656
Claims priority, application Japan, Jul. 20, 1983, 58-132191
Int. Cl.⁴ F16L *5/00*
U.S. Cl. 248—56 **4 Claims**

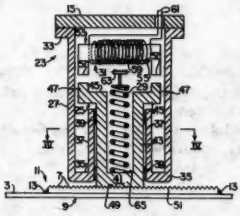


1. A hose midway holder comprising:
a tubular body adapted to be fixed on a hose;
a flange adapted to abut against the peripheral edge of a mounting hole of a mounting fixture; and
a groove in which is to be fitted a fixing clip for clamping the peripheral edge of the mounting hole of said mounting fixture together with said flange,
said hose midway holder being made of a pipe material and said flange existing as an outwardly bulging, inwardly recessed plastic deformation of said pipe material.

4,601,449
ELECTRIC PIPE SNUBBER

John E. Sharbaugh, Bullskin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1983, Ser. No. 543,598
Int. Cl.⁴ F16L *3/18*
U.S. Cl. 248—58 **14 Claims**

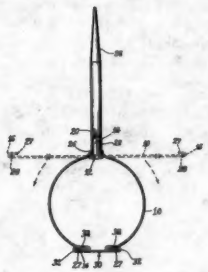


10. A pipe supporting system comprising:
a series of electric pipe snubbers fixed to a supporting structure and spaced along a length of the pipe, wherein each of said electric pipe snubbers comprises:
a plurality of axially spaced serrations about the outer surface of a section of a pipe;
an annular housing fixed to the supporting structure, said annular housing being radially spaced from and disposed about said section of pipe;
a plurality of brake means carried by said annular housing, said brake means normally biased for reciprocating engagement with said serrations to prevent axial displacement of said section of pipe relative to said fixed annular housing; and
electromagnetic means for intermittently releasing said brake means for engagement with said serrations to permit axial displacement of said section of pipe relative to said fixed annular housing; and
a means for controlling the activation of each of said electromagnetic means.

4,601,450
PIPE KEEPER AND METHOD OF MAKING

Jonas T. Lindquist, 7654 Tripp Ave., Skokie, Ill. 60076

Filed Mar. 25, 1985, Ser. No. 715,889
Int. Cl.⁴ F16B *15/00*
U.S. Cl. 248—71 **2 Claims**

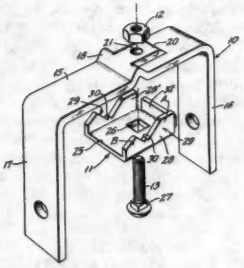


1. A pipe keeper comprising a strap, means for attaching the strap between its ends to a support structure, and means engaged with said ends for clamping the strap around a pipe said first-mentioned means comprising an anchor having an elongated recess in one end aligned with a hole in the strap, said one end facing the strap at the outer side thereof, a pin tightly received in said recess and having a head bearing against the strap at the inner side thereof, and a collar, said collar bearing against the recess, the pin bottomed at the inner end of said recess and having a shrink fit in the recess to hold the pin, the collar, the strap, and said anchor in an assembled relationship.

4,601,451
DUAL AMPLIFIER TAP BRACKET OR THE LIKE

Ignazio Leonardo, Mountainside, N.J., assignor to Diamond Communication Products, Inc., Garwood, N.J.

Filed Nov. 16, 1982, Ser. No. 441,993
Int. Cl.⁴ H01R *7/08*; F16L *3/08*
U.S. Cl. 248—74.1 **14 Claims**



1. A suspension-cable fitting for clamped assembly to a longitudinally extending messenger wire or the like cable of given-diameter, comprising a unitary stiff metal bracket of generally U-shape formed from strip material, said bracket having a base panel with a separate side panel depending integrally from each end of said base panel, said base panel being characterized by a central upwardly displaced transverse rib of

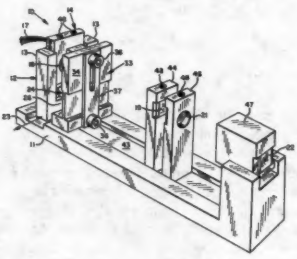
concave sectional span and depth to nest and locate substantially half the cross-section of the messenger wire or the like, whereby said bracket is self-stabilizing when so placed on the wire or cable as to receive the wire or cable in the concavity of the rib, a localized portion of said base panel adjacent said rib being displaced at offset from the rest of said base panel and to substantially the extent of offset at said rib, said localized portion having a bolt-receiving aperture on a vertical axis of alignment offset from the elongation axis of said rib; and a channel-shaped clamp member of formed stiff sheet material having a base and upstanding walls which are spaced to receive the width of said base panel therebetween, said base having a bolt-receiving aperture, and a bolt through both apertures, each of said side walls having an upwardly open generally V-shaped recess on the transverse alignment of wire or cable nesting in said rib.

4,601,452

LASER DIODE MOUNTING SYSTEM

Joseph F. Rando, Los Altos Hills, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Oct. 11, 1984, Ser. No. 659,578
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—178 **24 Claims**



1. A laser diode adjustable mounting system for adjusting the location of the diode and for directing the beam of the diode in X (side-to-side), Y (up-and-down) and Z (forward-and-back) directions as well as rotationally for azimuth and tilt angle, said mounting system comprising,

a frame,

a mounting fork with two spaced prongs extending generally vertically,

fork mounting means for connecting the fork to the frame and for permitting adjustment movement in the X direction, and

a generally rectangular diode holder block containing the diode oriented forwardly, the block having cylindrical, generally arcuate, convex vertical edges which are engaged between the prongs of the mounting fork;

whereby the diode holder block may be moved for adjustment by sliding and rotational manipulation between the prongs, (a) up-and-down, in the Y direction, (b) forward-and-back, in the Z direction, and (c) rotationally about a generally vertical axis for azimuth, and (d) rotationally about a generally transverse horizontal axis for tilt.

4,601,453

OPEN REEL ADJUSTABLE HANGER

Michael Kagan, 116 Viceroy Rd., Bldg. B Unit #9, Concord, Ontario, Canada

Filed Jul. 26, 1984, Ser. No. 634,552
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—329 **20 Claims**

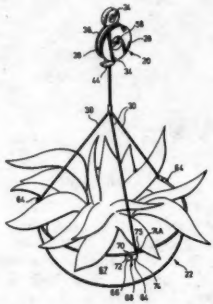
1. A "hanger support" suitable for use in hanging a receptacle, planter or other item, the support comprising:

(1) a hanger from which the support may be secured to hang a planter or other item, from, for example, a hook in the ceiling, the hanger having a plane or zone disposed or oriented in the vertical direction

(a) when the "hanger support" is secured or suspended for handing for example, a receptacle, planter or other item, and,

(b) a position whereat the hanger would be supported when the support is used to hang the planter or other item;

(2) a take-up reel having an endless channel defined between a pair of walls extending from either end of the reel, the take-up reel secured to the hanger for taking up material for supporting the planter or other item; the take-up reel incorporating a plane or zone disposed in the vertical direction when the "hanger support" is secured or suspended for hanging the planter or other item, and



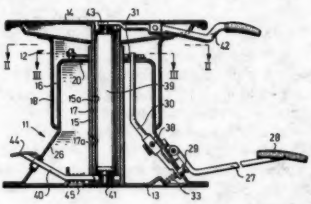
(3) a lock vertically below the reel and hanger offset ot the plane or zone of the take-up reel but in vertical alignment with the plane or zone of the hanger, to cause material extending downwardly from the reel to be offset relative to the plane or zone of the reel and into the vertical plane or zone of the hanger and in vertical alignment with the position in the hanger, whereat the hanger would be secured to support the "hanger support" whereby there exists neither rotational forces exerted about the hanger causing the reel to rotate about the hanger nor forces tending to cause the reel to tilt out of a vertical plane or zone.

4,601,454

TELESCOPIC SUPPORTING POST

Lars B. E. Mattsson, Sävar, Sweden, assignor to Svenska Vision AB, Stockholm, Sweden

Filed Aug. 20, 1984, Ser. No. 642,246
Claims priority, application Sweden, Aug. 22, 1983, 8304543
Int. Cl.[4] A47C *3/20*
U.S. Cl. 248—418 **4 Claims**



3. A telescopic supporting post comprising:

two mutually displaceable telescopic members each of said two mutually displaceable telescope members having an inner tubular portion of comparatively small diameter and an outer tubular portion of comparatively large diameter,

the inner portions of the two mutually displaceable telescope members being provided with cooperating bearing surfaces by which the two mutually displaceable telescope members are journalled for axial displacement relative to each other,

the outer portions of the two mutually displaceable telescope members being provided with cooperating interengagement means for holding the two mutually displaceable telescope members against mutual rotation and in axial alignment during telescopic displacement,

said cooperating interengagement means being arranged for releasable engagement with each other to prevent relative rotary movement between the two mutually displaceable telescope members when said cooperating interengaging means are in engagement with each other in an engagement position and to permit the two mutually displaceable telescope members to rotate relative to each other, utilizing said bearing surfaces as rotary bearing surfaces, when said cooperating interengaging means are out of engagement with each other in a release position,

said cooperating interengagement means includes

at least one first interengagement means provided in a radially fixed position on the outer portion of one of said two mutually displaceable telescope members, and

at least one second interengagement means mounted for movement in a generally radial direction on the outer portion of the other of said two mutually displaceable members and being biased towards a position for engagement with said at least one first interengagement means,

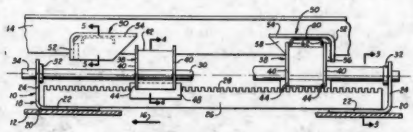
said second interengagement means being operatively connected to an operating means for movement by said operating means from said engagement position to said release position where said second engagement means is located out of engagement with said at least one first interengagement means, and a locking means for releasably locking said second interengagement means in said engagement position, said locking means being biased towards a locking position for locking said second interengagement means in said at least one first interengagement means.

4,601,455

COMBINATION MEMORY AND SAFETY STOPS FOR SEATS

Steven P. Lowe, Box 649, Weatherford, Okla. 73096, and Joseph H. Stuever, Oklahoma City, Okla., assignors to Steven P. Lowe, Sr., Weatherford, Okla.

Filed Aug. 24, 1984, Ser. No. 643,876
Int. Cl.[4] B60N *1/08*
U.S. Cl. 248—429 **8 Claims**



1. In combination with a seat adjustably mounted on the floor of a vehicle for fore-and-aft movement:

abutment means secured to the seat;

locking means secured to the floor of the vehicle extending fore-and-aft with respect to the seat including a bar extending fore-and-aft and having a series of notches in the upper surface thereof along the length of the bar;

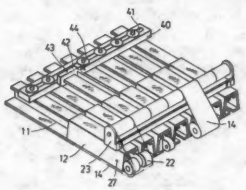
first stop means adjustably mounted on the locking means for positioning at selected fore-and-aft locations on the locking means in the path of movement of the abutment means when the seat is moved, the first stop means including at least one plate sized to be inserted in selected notches of said bar; and wherein the first stop means comprises a pair of fore-and-aft end plates connected by a side plate, said end plates being arranged to be inserted in selected pairs of said notches.

4,601,456

APPARATUS FOR FORMING A CONCRETE STRUCTURE

Shaw G. Jan, No. 64 Chung Lin Li, Da Lin Cheng, Chia Yi Hsien, Taiwan

Filed Mar. 14, 1985, Ser. No. 711,703
Int. Cl.[4] E04G *9/08*
U.S. Cl. 249—91 **19 Claims**



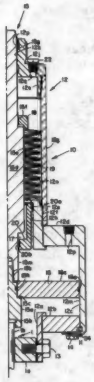
1. An apparatus used for forming a concrete structure comprising: a plurality of telescopic members having a surface against which concrete is formed, said members, to be assembled into a size variable form unit, each of said members including a first member, a second member slideably inserted into said first member, means for connecting said telescopic members side by side, and means for levelling said concrete forming surface of said telescopic member including a spool on which is wound a flexible sheet member attached to said first member, one end of said sheet member being affixed to one end of said second member, said sheet member being unwound and laid flat on one surface of said first member when said second member is drawn outward so that the surface of said first member is flush with the surface of said second member.

4,601,457

FLUID PRESSURE ACTUATOR VALVE

Peter W. Austin, New Orleans, and Dennis R. Cutcher, Gretna, both of La., assignors to Baker CAC, Inc., Belle Chasse, La.

Filed Oct. 1, 1985, Ser. No. 782,513
Int. Cl.[4] F16K *31/12*; F15B *21/04*; F01B *7/03, 11/02*
U.S. Cl. 251—63 **12 Claims**



1. A linear actuator for an axially movable stem of a valve,

comprising, a tubular housing having one end portion fixedly connectable to the valve in surrounding relation to the valve stem and another end portion defining a first seal bore; a rod-like actuator inserted in said housing and having one end attachable to the valve stem and the other end slidably and sealingly engaging said seal bore; a main piston secured to said actuator; said tubular housing defining a first cylindrical chamber cooperable with the periphery of said main piston; means for supplying fluid pressure to said first cylindrical chamber to urge said main piston axially relative to said tubular housing to shift the valve stem; said tubular housing defining a second cylindrical chamber surrounding a medial portion of said actuator; resilient means mounted in said second cylindrical chamber opposing said fluid pressure induced movement of said actuator; said housing further defining a second seal bore interconnecting said first and second cylindrical chambers; a non-compressible liquid filling said second cylindrical chamber; and an auxiliary piston slidably and sealably mounted in said second seal bore, thereby accommodating temperature expansion of said non-compressible liquid in said second cylindrical chamber and permitting axial movements of said actuator without changing the volume of said second cylindrical chamber.

4,601,458

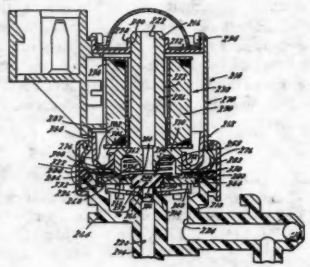
MAGNETIC AIR VALVE

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Continuation-in-part of Ser. No. 311,192, Oct. 14, 1981, abandoned. This application Mar. 29, 1983, Ser. No. 480,074

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.19 **8 Claims**



1. In a magnetic valve having a valve member engageable with a valve seat, a movable armature member connected to said valve member for urging said valve member into and out of said engagement with said valve seat, magnet means for moving said armature member in an axial direction toward said magnet means when said magnet means is energized, the improvement comprising means for imparting a tilting rotational component to at least the initial movement of said armature member and for moving at least a portion of said valve member in a tilting rotational manner relative to said valve seat in response to said tilting rotational movement of said armature member, at least a peripheral portion of said armature member tending to move toward a laterally peripheral portion of said magnet means during said tiliting rotational movement of said armature member, gap means for maintaining a non-magnetic gap between said magnet means and said armature member in order to control the magnetic flux flow and the magnetic flux decay between said magnet means and said armature member when said magnet means is energized and deenergized, respectively, a separate non-magnetic wear plate disposed axially adjacent said peripheral portion of said magnet means and between said peripheral portion of said magnet means and said armature member, said wear plate being impacted by said peripheral porton of said armature member during said tilting rotational movement of said armature member in order to substantially prevent said peripheral portion of said armature member from impacting upon said peripheral portion of said magnet means, said magnet means including a core flange portion disposed laterally inwardly of said peripheral portion, said core flange portion extending beyond said non-magnetic wear plate in an axial direction generally toward said armature member in order to engage said armature member after said tilting rotational movement of said armature member caused by energization of said magnet means.

4,601,459

IMPROVED BUTTERFLY VALVE

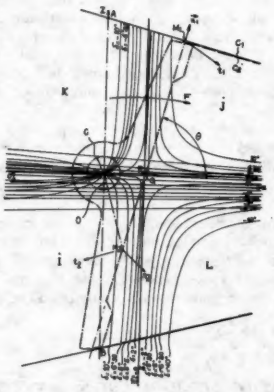
Alain B. A. Verdelet, Saint Valery en Caux, France, assignor to Masoneilan International Inc., Dallas, Tex.

Filed Nov. 2, 1984, Ser. No. 668,553

Claims priority, application France, Nov. 7, 1983, 83 17656

Int. Cl.[4] F16K *1/226*

U.S. Cl. 251—306 **5 Claims**



1. In a butterfly valve comprising a body, a passage extending through said body and having an axis, a seat carried by the body and disposed in said passage, a closure member mounted in said passage for rotation about an axis orthogonal to the axis of said passage so as to be movable between a closing position in which a sealing element carried by a periphery of the closure member has a sealed contact with said seat and a fully open position substantially perpendicular to the closing position, a peripheral surface of the closure member and a conjugate surface of the seat being conical surfaces defined by two cones of revolution, the axis of rotation of the closing member being offset along the axis of the passage away from the apex of the cone defining the surface of the seat relative to a mean plane of the closure member, the improvement wherein, for a given value of the apex angle 2ϕ of the cone defining the seat of the valve and for a given position C of the axis of rotation of the butterfly member in an orthonormal system Ox,y,z in which the axis Ox coincides with the axis of said cone, there is defined a joint plane of the butterfly member with its seat, of which a couple of points in respect of which a clearance angle which is maximum, has for trace a point Q located in the plane (Ox, z) of the system having coordinates and a clearance angle given by the following approximate relations:

$$X_Q = \sin\phi \cos\phi\,(1 - C^2)$$

$$Z_Q = \alpha(1 - \sin^2\phi\,(1 - C^2))$$

-continued

$$\sin\delta_Q = -\frac{c}{\cos\phi}\sqrt{\frac{1}{1 + C^2\tan^2\phi}}$$

in which C is the distance between the trace of the axis of rotation of the butterfly member and the centre 0 of the system and an inclination angle θ of the butterfly member relative to the axis of the passage being given by the relation: complement of the blocking angle $< \theta \leqq (\pi/4)$.

4,601,460

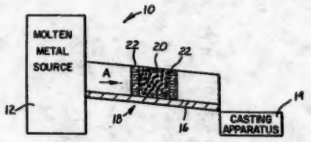
TECHNIQUE FOR REMOVING IMPURITIES FROM A COPPER MELT

Derek E. Tyler, Cheshire; Harvey P. Cheskis, North Haven, and Paul D. Tungatt, Middletown, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 599,098, Apr. 11, 1984. This application Apr. 29, 1985, Ser. No. 728,632

Int. Cl.[4] C21C 7/00

U.S. Cl. 266—216 **17 Claims**



1. An apparatus for removing impurities from molten copper or a molten copper base alloy, said apparatus comprising:

means for treating said molten copper or copper base alloy so as to remove at least some of said impurities, said treating means being formed from a silicon carbide containing material comprising from about 5% to about 99% silicon carbide and at least one material selected from the group consisting of a filler material and a bonding material and having exposed silicon carbide particles for contacting said molten copper or copper base alloy.

4,601,461

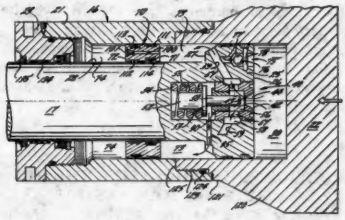
LADING PROTECTION DEVICE

Steve A. Brough, Gardners, and Mark P. Scott, Boiling Springs, both of Pa., assignors to Keystone Industries Inc., Camp Hill, Pa.

Filed May 14, 1984, Ser. No. 609,816

Int. Cl.[4] F16F 9/06

U.S. Cl. 267—64.15 **18 Claims**



1. A lading protection device for a railway car interposable between the car and a coupler comprising a cylinder having a closed end and an access end, a main piston having a circular front face and an annular back face relatively slidable in the cylinder toward and away from the closed end thereof, a piston rod integral with the piston and snugly telescoped into the access end of the cylinder, a body of hydraulic fluid normally captive between the front face of the piston and the closed end of the cylinder, a flow control valve assembly in the piston, said control valve assembly including an orifice bushing occupying a recess in the piston, said orifice bushing having formed thereon a circular land facing inwardly and defining a constricted circular orifice, the control valve assembly having a valve stem telescoped with respect to the piston for sliding movement, the stem having a presented end and an inner end, the presented end of the valve stem having a diameter greater than that of the orifice, a spring in the piston at the inner end of the stem for pressing the stem axially outward so that its presented end is normally in sealing engagement with the land surrounding the orifice to prevent the flow of hydraulic fluid through said orifice and to present a predetermined surface area on the end thereof that is exposed to pressure of said body of hydraulic fluid between said front face of the piston and the closed end of the cylinder, means in said piston defining an annular chamber in communication with said land, the piston having a fluid passage for connecting the annular chamber to the back face of the piston, means for adjustably pre-compressing the spring for applying preload between the stem and the land on the orifice bushing so that when the piston rod is impacted relative to the cylinder the pressure of the hydraulic fluid in the cylinder rises to a predetermined threshold level at which the pressure of the fluid causes the stem to retreat from the orifice so that the displaced fluid may throttlingly pass through the orifice into the chamber and to the back face of the piston accompanied by absorption of energy, an annular separator piston disposed around said piston rod for relative sliding movement with respect to the piston rod, said separator piston having a normal position adjacent the back face of the main piston for defining with the latter a fluid receptacle, the space between the separator piston and the access end of the cylinder being filled with a charge of gas under high pressure which is further compressed by the retreating movement of the separator piston as the fluid is displaced, the main piston having a one-way return valve interconnecting the faces thereof so that when the impact has been dissipated the gas pressure acting upon the separator piston returns the separator piston to its normal position and forces the fluid through the return valve restoring the fluid to its normal position adjacent the front face of the main piston in readiness for a succeeding impact.

4,601,462

BOOK MAKING APPARATUS AND METHOD WITH DIVERTOR BETWEEN BINDARIES

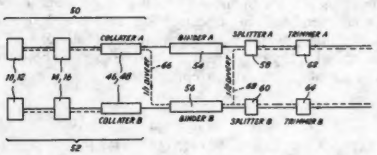
Kenneth A. Bowman, Bristol, England, assignor to DRG (UK) Limited, Bristol, England

Filed Jul. 3, 1984, Ser. No. 627,909

Claims priority, application United Kingdom, Jul. 7, 1983, 8318465

Int. Cl.[4] B41F 13/64

U.S. Cl. 270—12 **2 Claims**



1. Apparatus for making books, said apparatus comprising a pair of bookmaking assemblies each comprising: a respective one of first and second printing presses for producing signatures "two up"; a respective bindery for binding the signatures produced by the press into books; a respective splitter downstream of the bindery for splitting a bound batch of signatures into two books; first diverting means having diverting and non-diverting configurations such that in the diverting configuration thereof, the first diverting means acts to divert the output of the first said press and combine that output with the

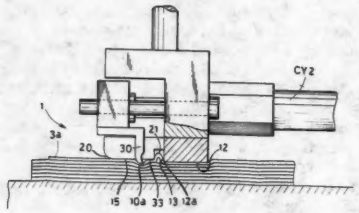
output of the second said press so that the combined output is feedable to the bindery associated with the second press and, in the non-diverting configuration thereof, the first diverting means is inactive and the bookmaking assemblies are independently utilizable; and second diverting means disposed between the bindery of the second press and its respective splitter, said second diverting means being operable to divert a part of the output of the second bindery to the splitter of the first press.

4,601,463

CLOTH GRIPPING DEVICE

Hidetaka Goto, and Tetsuo Nakamura, both of Ohno, Japan, assignors to Matsuya Hoseikiki Hanbai Kabushiki Kaisha, Ohno, Japan

Filed Jul. 3, 1984, Ser. No. 627,468
Int. Cl.[4] B65H *3/22, 3/54*
U.S. Cl. 271—19 **5 Claims**



1. A cloth gripping device comprising:

a pressing member including a portion for pressing a cloth to grip the same and a claw member for cooperating with said pressing member to grip the cloth therebetween;

said pressing member having formed on a bottom thereof a pressing face located in a first plane for pressing the cloth;

a retracted face located in a second plane at a different elevation relative to said first plane, said different elevation corresponding to the thickness of a single cloth positioned in engagement with said retracted face, so that the space between said first and second planes is designed to accommodate only a single cloth;

a substantially vertical gripping wall provided by a step between said pressing face and said retracted face; and

a gripping groove having a predetermined width for receiving a bent portion of a single cloth therein when only one single cloth is picked up adjacent a boundary between said pressing face and said retracted face, said gripping groove being juxtaposed between said pressing face and said retracted face;

said retracted face having a guide groove formed therein for guiding said claw member toward said gripping groove;

said claw member being disposed for reciprocal movement in a direction toward said gripping wall along said guide groove whereby only one cloth can be gripped between said claw member and said gripping wall.

4,601,464

LEGS EXERCISING PHYSICAL THERAPY DEVICE

Canellen K. Mousel, 801 Eleventh St., Arapahoe, Nebr. 68922

Filed Aug. 24, 1984, Ser. No. 644,029
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—73 **3 Claims**

1. Legs exercising physical therapy device utilizeable alternatively with chair and sleeping bed patient carriers, said legs exercising physical therapy device comprising:

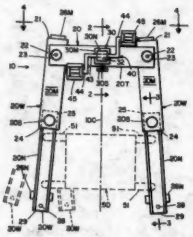
(A) a substantially horizontal transverse-bar intersecting a longitudinally extending horizontal central-axis;

(B) upright standard means including: a tubular-collar extending vertically and non-pivotable uprightly from a central portion of said transverse-bar whereby said tubular-collar overlies said central-axis, a vertical riser slidably associated within said tubular-collar and being provided with a transversely extending bearing located above said tubular-collar, and standard-setscrew means extending from the tubular-collar and against the slidably associated riser for locking the riser at various elevations;

(C) cranking means comprising a pair of crank-offset portions respectively flanking the vertical riser and further comprising an intervening crank-shaft portion journalled by said transversely extending bearing of the vertical riser, said respective crank-offset portions being provided with rotatably secured pedals for engagement by the patient's feet; and

(D) a pair of elongate wings flanking said tubular-collar, the two wings having their sole connection at said transverse-bar and respectively comprising three substantially horizontal and colinearly extending arms including:

(i) a pair of substantially horizontal and tubularly polygonal primary-arms respectively having a front-end and a rear-end, said primary-arms flanking said tubular-collar and being located beneath the transverse-bar, each said primary-arm adjacent the front-end thereof being pivotably attached to the transverse-bar with a releasable locking means for maintaining the angular relationship between the primary-arm and the transverse-bar;



(ii) a pair of substantially horizontal secondary-arms of U-shaped channel cross-section and respectively having a lead-end and a trail-end, each said secondary-arm being telescopically received within a primary-arm at the rear-end thereof, and primary-setscrew means extending between the primary-arm and the secondary-arm and the secondary-arm for releasably maintaining a selected telescoped lengthwise relationship between the primary-arm and secondary-arm, wherein the secondary-arm, nearer to the trail-end than to the lead-end, is provided with a vertical aperture therethrough; and

(iii) a pair of substantially horizontal and wholly uniplanar tertiary-arms and respectively having a head-end relegated within the channel of the secondary-arm, each said tertiary-arm adjacent the head-end thereof being removably connected at said aperture to the secondary-arm adjacent the trail-end thereof.

4,601,465

DEVICE FOR STIMULATING THE HUMAN RESPIRATORY SYSTEM

Jean-Yves Roy, 5091, 18e Avenue, Montreal, Quebec, Canada (H1X 2N8)

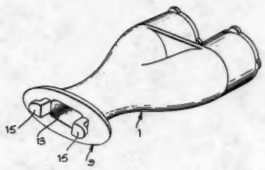
Filed Mar. 22, 1984, Ser. No. 592,474
Int. Cl.[4] A63B *23/00*; A61M *16/00*
U.S. Cl. 272—99 **5 Claims**

1. A device for simulating the human respiratory system by making breathing more difficult and limiting lung ventilation, said device comprising:

a mouth-piece for insertion in the mouth of a person, said mouth-piece having a central opening through which the person may breathe,

a tubular body defining an air duct, said tubular body being connected at one end to the mouth-piece with the air duct in alignment and communication with the opening of said mouth-piece, and

obstruction means mounted in the tubular body at the other end thereof to put up a breathing resistance in both the inspiratory and expiratory directions, said mouth-piece, tubular body and obstruction means being very compact in size and light enough to be carried exclusively through the mouth-piece when the same is inserted in the mouth of the person, said tubular body further being long enough to increase the dead space of the respiratory system of the person using the device,



wherein:

the air duct at the end of the tubular body opposite to the mouth-piece is divided into two parallel separate passages;

the obstruction means is mounted in only one of said passages and consists of a membrane permeable to air;

said obstruction means also comprises means to make it detachable and removable;

a check valve is mounted in the other passage to allow air to be freely breathed in at least one of the respiratory direction, said check valve comprising: means to make it detachable and reversible, thereby permitting selection of the direction in which air is allowed to be freely breathed in the passage in which said check valve is mounted.

4,601,466

EXERCISE WEIGHT

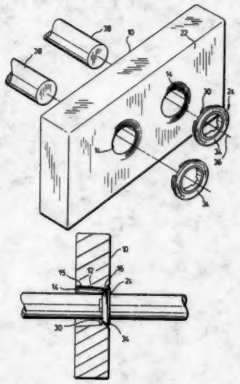
Edgar H. Lais, Weston, Canada, assignor to Global Gym & Fitness Equipment Limited, Weston, Canada

Filed Feb. 25, 1983, Ser. No. 469,916

Claims priority, application Canada, Jan. 6, 1983, 418983

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—118 **7 Claims**



1. An exercise weight movable along an elongate rod, said weight comprising:

a body having an aperture therethrough and a bushing mounted in said aperture;

said aperture being defined by an inner wall;

locating means extending inwardly from said inner wall to engage said bushing and position it in said aperture;

said bushing having an inner wall defining a central opening, an outer peripheral wall, and locking means extending outwardly from said peripheral wall and engaging said locating means to substantially inhibit movement of the bushing relative to the body longitudinally of the aperture,

said outer peripheral wall conforming substantially in shape but being reduced in radial dimension with respect to

said locating means to permit said bushing to move laterally in the aperture relative to the weight-body and thereby accommodate irregularities in and rod when the weight is mounted thereon and moved therealong.

4,601,467

VALVE MODULE AND APPARATUS THEREFOR

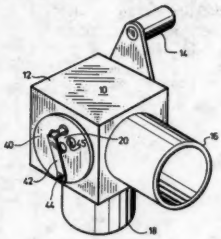
William Gvoich, 281 Rainbow Dr., Hamilton, Canada (L8K 4G3), and John B. Rogers, R.R. #1-Hunts Point, Queens County, Nova Scotia, Canada

Filed Oct. 12, 1984, Ser. No. 660,519

Claims priority, application Canada, Feb. 28, 1984, 448487

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—130 **22 Claims**



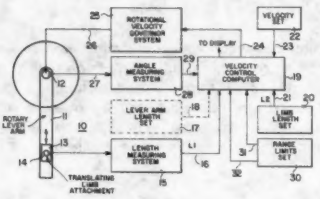
1. A valve module for use with an exercise device, said valve module comprising a housing having a centre axis, and entrance conduit to allow air to enter the valve module; an exit conduit to allow air to exit from the valve module; a pair of valves to control the flow of air through the module, said valves being rotable about said axis; said housing having a rotatable seat which divides the housing into a first chamber which communicates with the extrance conduit and a second chamber which communicates with the exit conduit or which is sealed from either chamber depending upon the orientation of the rotatable seat; said seat having a first vented valve disc mount contained within the housing and a second vented valve disc mount perpendicular to said first valve disc mount and flush with the housing; said first valve of said pair of valves comprising said vented valve disc mount and a rubber valve disc secured to one surface of said mount; said second valve comprising a pressure release and priming intake valve unit which comprises a second rubber valve disc secured to said second vented disc valve mount; and an air pressure release means mounted on said seat and communicating with one of the vents in the second vented disc valve mount.

4,601,468

EXERCISE AND DIAGNOSTIC SYSTEM AND METHOD

Malcolm L. Bond, Winters, and Philip T. Dempster, St. Helena, both of Calif., assignors to Loredan Biochemical, Inc., Davis, Calif.

Filed Jan. 6, 1984, Ser. No. 568,751
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—130 20 Claims



18. In a muscle exercise system, a lever arm; means mounting said lever arm for rotation about a fixed axis; connecting means for connecting a selected portion of the human body to said lever arm for rotation with said lever arm about a selected anatomical axis of rotation, including mounting means establishing between said lever arm and said body portion a fixed tangential mounting relation and sliding radial mounting relation along the axis of the lever arm to permit free radial movement therebetween during an exercise motion of said human body portion; and velocity control means coupled to said lever arm for limiting the maximum permitted rotational velocity of said arm.

20. In a method for controlled accommodating resistance exercise, the steps of:

mounting a lever arm for rotation about a fixed axis;

disposing a human body attachment device on said lever arm in a tangentially fixed and radially movable mounting relation along the axis of the lever arm to permit free radial movement of said connecting means relative to said fixed axis during an exercise motion;

contacting said attachment device with a selected portion of the human body for rotation of said attachment device and lever arm with said body portion about an anatomical axis of rotation; and

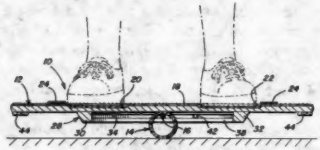
restraining rotation of said lever arm to an angular velocity less than or equal to a maximum value.

4,601,469

BALANCE BOARD WITH ROLLER RETAINER PIN

Martin V. Sasser, Jr., 2975 Holly Dr., Tracy, Calif. 95376

Filed Apr. 5, 1984, Ser. No. 597,085
Int. Cl.[4] A63B 7/08, 23/04
U.S. Cl. 272—146 11 Claims



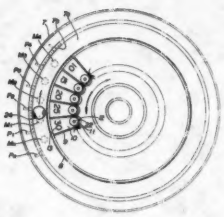
1. A balance board structure comprising a foot platform, a tubular roller under the platform and roller retention means comprising an elongate pin extending loosely through the roller, the pin having opposite end portions extending from opposite ends of the roller, the opposite end portions of the pin being received in respective elongate guide channels formed on the foot platform.

4,601,470

ROULETTE GAMING APPARATUS HAVING ELECTRO-MAGNETIC APPARATUS FOR DRIVING A BALL

Otomatsu Kadota, and Masao Kobayashi, both of No. 5-3, Hirakawacho 2-chome, Chiyodaku, Tokyo, Japan

PCT No. PCT/JP83/00052, § 371 Date Sep. 9, 1983, § 102(e) Date Sep. 9, 1983, PCT Pub. No. WO83/02904, PCT Pub. Date Sep. 1, 1983
PCT Filed Feb. 22, 1983, Ser. No. 537,451
Claims priority, application Japan, Feb. 22, 1982, 57-026951
Int. Cl.[4] A63F 5/04
U.S. Cl. 273—142 E 6 Claims



4. A roulette game comprising:

a ball,

a rotatable disk having (a) an axis of rotation, (b) an outer circular passageway for said ball, and (c) a series of pockets, each of which is configured to receive the ball; each pocket being located closer to said axis than said outer circular passageway,

ball moving means associated with said outer circular passageway for sensing the ball and applying a force to the ball to cause it to move relative to said passageway in a first angular direction, and

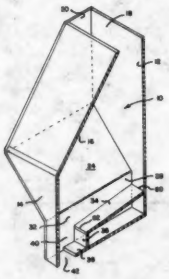
control means for said rotatable disk, and for said ball moving means, for rotating said rotatable disk in said first angular direction, for activating said ball moving means, and for thereafter reversing the direction of said rotatable disk and deactivating said ball moving means so that the ball will coast in the opposite angular direction to the movement of said rotatable disk and come to rest in one of said pockets.

4,601,471

RANDOM NUMBER GENERATOR

Alan Frank, 5600 Munhall Rd., Pittsburgh, Pa. 15217

Filed Jul. 3, 1985, Ser. No. 751,689
Int. Cl.[4] A63F 7/00
U.S. Cl. 273—144 B 14 Claims



1. A random ball selector device comprising a chamber for

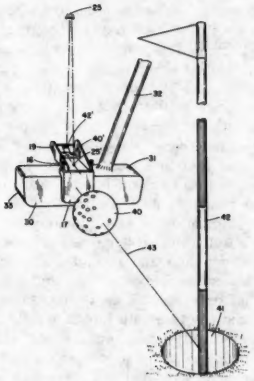
mixing balls, said chamber having inlet opening means in the region of the bottom thereof for the admission of a fluid stream and separate discharge opening means for the discharge of said fluid stream, the lower region of said chamber comprising a trough means extending from the rear to the front of said chamber, ramp means within said trough means, pocket means at the front of said ramp means for receiving a randomly selected ball from said ramp means, said inlet opening means being near the bottom of said pocket means, partial enclosure means adjacent to said opening means and near the bottom of said pocket means for creating aspiration relative to said ramp means, inclined facing sidewall means defining said chamber and sloping upwardly and outwardly from said trough means, the depth of said trough means and the slope of said inclined facing sidewall means being adapted to permit a randomly selected ball to move from said ramp means into said pocket means underneath non-selected balls positioned along said inclined facing sidewall means upon cessation of said fluid stream.

4,601,472

SIGHTING DEVICE FOR A GOLF PUTTER

Michael O'Flanagan, "Sweet Auburn", Cherrywood Road, Loughlinstown, Co. Dublin, Ireland

Filed Nov. 2, 1983, Ser. No. 547,919
Claims priority, application Ireland, Nov. 4, 1982, 2633/82
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 A **11 Claims**



1. A sighting device for releasably mounting on the blade of a golf putter having a substantially planar front putting face with a substantially centrally disposed sweet spot, the sighting device comprising:

a. a putter blade mounting frame, including means for fixedly but releasably mounting the sighting device on a putter blade without alteration of the putter blade, such that the putter can be restored to its original condition after the sighting device is removed, said means for releasably mounting the sighting device on a putter blade comprising a front flange adapted to extend downwardly over the sweet spot of the putting face of a putter blade, and the front flange comprising a substantially vertically disposed planar front face for striking a ball, and the front flange having a rear face for interengagement with a fixing means for releasably mounting the frame on the putting face of a putter blade;

b. a mirror mounting frame fixedly mounted to said putter blade mounting frame, such that the mirror mounting frame is fixedly mounted thereby relative to the putter blade;

c. an eye aligning mirror fixedly housed in the mirror mounting frame, with the putter blade mounting frame and mirror mounting frame positioning a reflective surface of the eye aligning mirror to be behind the front flange and at right angles to the putting face of the blade in a substantially horizontal position when the putter is placed in position behind a ball prior to a putting stroke with the putter, such that an eye of the user can be sighted and aligned above the eye aligning mirror with an image of the eye therein; and

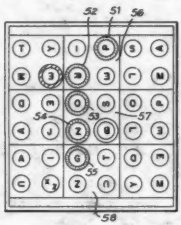
d. a ball and target aligning mirror fixely housed in the mirror mounting frame behind the front flange and adjacent the eye aligning mirror, with the putter blade mounting frame and mirror mounting frame positioning a reflective surface of the ball and target aligning mirror to be inclined rearwardly and upwardly at an angle of approximately 135° with respect to the putting face, whereby the ball and target aligning mirror in use assists in aligning the putting face of the blade and said front flange square to a target path sight line between a ball and a target with the putter sweet spot being on the target path sight line, while the eye aligning mirror in use assists in aligning the eye of the user over the target path.

4,601,473

WORD FORMING GAME

Ronald D. Dubren, and Patricia C. Dubren, both of 159 Second Ave., New York, N.Y. 10003

Filed Sep. 28, 1984, Ser. No. 656,141
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—272 **10 Claims**



1. Game playing apparatus for two or more game players, comprising,

a plurality of individual letters arranged as a letter array,

means operable by each of said game players for forming, into words, individual letters from said letter array,

means for associating letters comprising a particular word formed, with the game player forming said particular word, and

means for changing a first association of a predetermined group of letters with a first player, to association of said predetermined group of letters with a second player, said changing means operative during word formation by said second player.

4,601,474

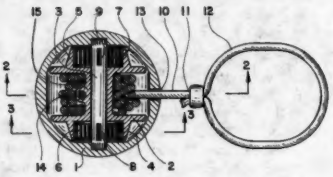
SELF-RETRIEVING ATTACK BALL

Hyok S. Lew; Yon K. Lew, and Hyon S. Lew, all of 7890 Oak St., Arvada, Colo. 80005

Filed Jan. 22, 1985, Ser. No. 693,993
Int. Cl.[4] A63B *67/10*
U.S. Cl. 273—414 **1 Claim**

1. A self-retrieving attack ball comprising in combination: a closed shell member including a hole through the wall of said closed shell member; a self-rewinding spool rotatably disposed within said closed shell member; a cord slidably engaging and extending through said hole through the wall of said closed shell member wherein one extremity of said cord is anchored

to said self-rewinding spool and the other extremity includes means for stopping said other extremity of said cord from retracting into the inside of said closed shell member, said means comprising a loop mmeber; and the outer surface of said



closed shell member including a plurality of protrusions; whereby, said self-retrieving attack ball automatically returns to the palm of the user after said self-retrieving attack ball is thrown by the user when said other extremity of said cord is secured to the user's hand.

4,601,475

HAT-SHAPED SHAFT SEAL OF MULTIPLE LAYERED MATERIAL

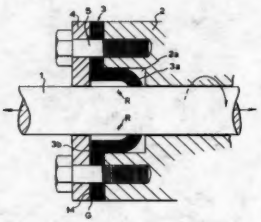
Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, England

Filed Oct. 17, 1985, Ser. No. 788,584

Claims priority, application United Kingdom, Oct. 17, 1984, 8426216

Int. Cl.⁴ F16J *15/12*

U.S. Cl. 277—205 **8 Claims**



1. An annular seal characterised in that it is of substantially hat shape with an axially apertured crown and an adjoining brim each comprised of a plurality of alternately interleaved layers of sheet metal and of a non-metallic material selected from expanded graphite, carbon, natural or synthetic rubber or bonded fibrous material.

4,601,476

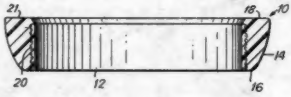
SQUEAK FREE SEAL FOR EXHAUST COUPLINGS

Peter P. Usher, Union, and Eugene J. Gavaletz, Toms River, both of N.J., assignors to Metex Corporation, Edison, N.J.

Filed Nov. 28, 1984, Ser. No. 675,709

Int. Cl.⁴ F16J *15/12;* **B32B** *31/06*

U.S. Cl. 277—230 **7 Claims**



1. A heat cured exhaust seal adapted to be interposed between a pair of confronting pipes in sealing relationship therewith, comprising wire mesh having openings between the wires thereof and a mixture of metallic fibers, non-metallic filler, a thermally stable lubricant and a resin binder, the mixture surrounding the wires and substantially filling the openings in the wire mesh and forming the seal.

4,601,477

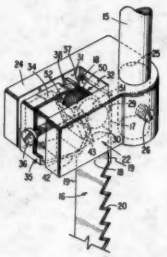
SABRE SAW BLADE CLAMP

Michael E. Barrett, and Chris Johnson, both of Easley, S.C., assignors to The Singer Company, Stamford, Conn.

Filed Jan. 10, 1985, Ser. No. 690,220

Int. Cl.⁴ B27B *19/00*

U.S. Cl. 279—30 **6 Claims**



1. A blade clamp for mounting a flat tool blade to a reciprocatory actuating bar of a power tool, said blade clamp comprising: a blade clamp body secured to said actuating bar and formed with a cavity having an exteriorily open mouth into which said tool blade is insertable lengthwise, a first substantially planar interior wall formed in said cavity extending substantially parallel to the direction of reciprocation of said actuating bar and defining one sidewall of said mouth, an abutment adjacent said first wall limiting insertion of a flat blade into said cavity, a second interior wall formed in said cavity opposite said first wall and inclined relatively to the direction of reciprocation of said actuating bar toward said cavity mouth, a cylindrical roller freely movable within said cavity between said first and second walls, resilient means acting between said blade clamp body and that side of said cylindrical roller opposite said cavity mouth for urging said roller toward said cavity mouth to clamp a flat blade against said first interior cavity wall, and operator influenced tool blade release means shiftably supported on said blade clamp body and engageable with that side of said cylindrical roller facing said cavity mouth for moving said roller against the influence of said resilient means.

4,601,478

SIMULATED FLYING FIGURE WITH MOVABLE WINGS

John C. Robertson, Bloomfield, and Paul S. Santarsiero, Avon, both of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 20, 1985, Ser. No. 703,306

Int. Cl.⁴ B62J *39/00*

U.S. Cl. 280—1.13 **19 Claims**

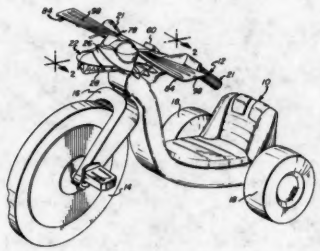
1. A unit adapted for mounting upon handlebar structure of a child's ride-on toy, for simulating a flying figure with flapping wings, comprising:

a housing having a normally horizontally extended forward portion, and a rearward portion angled downwardly therefrom for mounting upon an inclined surface of the handlebar structure;

a pair of support pieces pivotably mounted within said forward portion of said housing for movement about longitudinally extending axes on opposite sides thereof, said support pieces having inner end portions lying inwardly of the axes of pivoting and proximate one another for

simultaneous contact by a common actuating lever, and having outer end portions adapted to engage wing members for the support thereof, said housing having lateral openings therein providing access to said support pieces and permitting vertical reciprocation of wing members extending therethrough; and

a generally L-shaped actuating lever having one end portion pivotably mounted within said rearward portion of said housing for movement about a transversely extending



axis, and the other end portion extending forwardly therefrom and disposed for simultaneous operative engagement with said inner end portions of both of said supporting pieces, said actuating lever being substantially fully enclosed within said housing but having a portion accessible for manual operation externally thereof, whereby a flapping action of wing members supported by said supporting pieces can be simulated by alternate application and release of inward force upon said actuating lever.

4,601,479

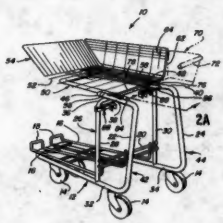
COMBINATION SHOPPING CART AND STOCK CART

James F. Reinbold, Norman, and Clarence W. Upshaw, Tuttle, both of Okla., assignors to UNR Industries, Inc., Chicago, Ill.

Filed Dec. 13, 1984, Ser. No. 681,135

Int. Cl.⁴ B62D *39/00*

U.S. Cl. 280—33.99 H **10 Claims**



1. A combination shopping cart and stock cart which comprises:

(a) a wheeled chassis providing a carton-carrying platform;

(b) a pair of generally vertical upright support posts carried by said chassis at the rear thereof, one on either side of the chassis;

(c) an inverted, U-shaped, generally vertical support member carried by the rear portion of said chassis, the bight between the downwardly extending legs of said inverted U-shaped support member comprising a horizontal cross support member that is located forward of the upper ends of said pair of upright support posts;

(d) a generally horizontal side support member on each side of the cart connecting each of said rear upright support posts with the outer end portions of the bight of said inverted U-shaped support member to provide a side support frame on each side of the cart;

(e) cantilever beam means pivotally mounted to said two side support frames to pivot from a generally horizontal, operative position extending forward of said inverted, U-shaped, vertical support member, said cantilever beam means being supported in said operative position by said horizontal cross support member and said pivotal mounting to said side support frames, to a substantially vertical, out-of-the-way position above said U-shaped support member, in which position said cantilever beam means lies substantially entirely outside the vertical space directly above said carton-carrying platform on the wheeled chassis of the cart, and back again, the pivot axis of said pivoted cantilever beam means being located rearward of said horizontal cross support member; and

(f) a basket defining a lading-carrying space, said basket being secured to said pivoted cantilever beam means so as to be supported by the latter selectively in either said generally horizontal, operative position of the cantilever beam or said substantially vertical, out-of-the-way position of the cantilever beam, with the rear end of said basket located substantially at said pivot axis of the mounting between said pivoted cantilever beam means and said two side support frames.

4,601,480

TRUCK

Lars I. Arwidsson, Västra Frölunda, and Lennart E. R. Dahlander, Gråbo, both of Sweden, assignors to Idux Industriell Exploatering AB, Sweden

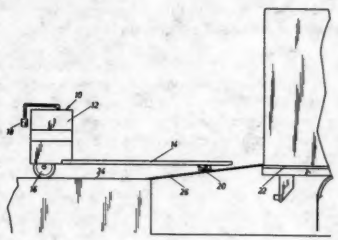
PCT No. PCT/SE84/00230, § 371 Date Feb. 19, 1985, § 102(e) Date Feb. 19, 1985, PCT Pub. No. WO85/00158, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 19, 1984, Ser. No. 709,687

Claims priority, application Sweden, Jun. 20, 1983, 8303519

Int. Cl.⁴ B60P *1/04*

U.S. Cl. 280—43.12 **5 Claims**



1. An improved truck designed to handle goods, said truck having a number of lifting forks, each fork being secured at one end to the body of said truck and at its opposite end to a vertically movable support wheel, and driving wheels arranged to pivot for supporting and steering said truck, the improvement comprising:

means for raising and lowering said truck relative to said driving wheels,

bogie means mounted on the lower face of said lifting forks, said support wheels being arranged in said bogie means,

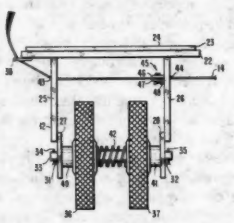
operating means for raising and lowering said bogie means relative to said lifting forks, and steering control means for pivoting said support wheels,

wherein said operating means and said steering control means are adapted to be operated independently of each other, and said truck body and said lifting forks are adapted to be raised and lowered independently of each other for adjusting the angular position of said lifting forks relative to said truck body.

4,601,481
PORTABLE BOAT DOLLY

George E. Maurice, R.R. 3, Clinton, Ind. 47842

Filed Nov. 23, 1984, Ser. No. 674,087
Int. Cl.[4] B62B *1/14*
U.S. Cl. 280—47.13 B 4 Claims



1. A readily mountable and removable portable boat dolly for mounting to a boat to aid in transporting said boat over land, comprising:

a pair of spaced independent wheel support units, each having a mounting surface made of high friction, resilient, rubber-like material for frictionally engaging the bottom of said boat, a mounting plate for supporting said mounting surface, and a pair of spaced axle support members extending downwardly from said mounting plate;

a wheel rotatably mounted to each of said wheel support units, said wheel being carried on an axle disposed between and supported by said axle support members;

a continuous mounting strap having hooks at both ends configured for hooking over the gunwales of said boat;

strap mounting means for maintaining said mounting strap in engagement with both of said wheel support units below the mounting surfaces thereof such that upward force applied to the hooks is applied upwardly via said strap to said wheel support units, and such that said mounting strap is slidable along its length with respect to said wheel support units;

adjustable means attached to said strap for limiting the spacing of said pair of wheel support units to a predetermined distance; and

strap tensioning means for applying and maintaining tension in said mounting strap, including a pivoted lever attached to at least one of the hooks, the mounting strap being attached to the lever, the lever being movable from a first orientation wherein said strap is slack to a second orientation wherein said strap is drawn taut, whereby the mounting surfaces of said wheel support units are drawn upward by said mounting strap and held in frictional engagement with the bottom of said boat.

4,601,482
SELF PROPELLED WAGON

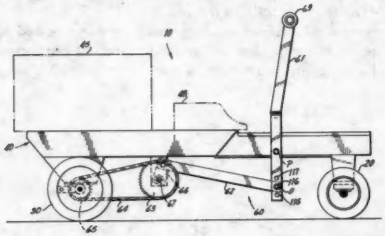
Marcio C. Ferez, Hialeah, Fla., assignor to Ferez Industries, Inc., Fla.

Filed Mar. 7, 1985, Ser. No. 709,135
Int. Cl.[4] B62K *21/00*; B62M *1/16*
U.S. Cl. 280—265 4 Claims

1. An improved self-propelled wagon, comprising:

A. a body having an underside including a stopper plate member mounted to said body's underside and said stopper plate member includes a bay having two angular walls chamfered;

B. front axle means pivotally mounted on the front end of said body having one freewheeling wheel mounted on each end, and further including stopper means that prevent said front axle means from turning beyond a predetermined angle so that it can be safely used to steer said wagon with the user's feet and said stopper means further having a moving plate member rigidly mounted to the upper side of said front axle means having an upwardly extending protrusion and said protrusion in cooperation with said stopper plate member constrains the angular movement of said moving plate, and consequently of said front axle means;



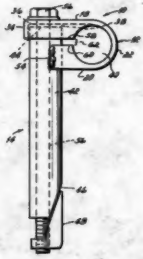
C. rear axle means mounted on the rear end of said body and having one wheel rigidly mounted on one end and a freewheeling wheel mounted on the other end of said rear axle means; and

D. propelling mechanism means for transmitting the human force of the user to said rear axle means.

4,601,483
SINGLE BOLT WELDED STEM ASSEMBLY

David K. McMurtrey, 540 S. Algonquin Dr., Maysville, Ky. 41056

Continuation-in-part of Ser. No. 424,004, Sep. 27, 1982, Pat. No. 4,501,435. This application Aug. 15, 1984, Ser. No. 640,955
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.[4] B62K *21/18*
U.S. Cl. 280—279 7 Claims



1. A stem assembly for securing the handlebars of a bicycle to the front fork of the bicycle frame comprising:

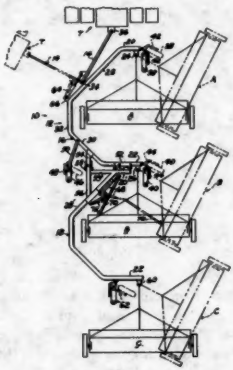
a tubular barrel having a longitudinal axis, a top end, a bottom end, and a side wall;

a sheet metal head including a top portion and a bottom portion, said bottom portion having spaced, parallel side sections, said head engaging said tubular barrel with said top portion overlying said top end of said tubular barrel and said side sections of said bottom portion abutting said side wall of said tubular barrel, each of said side sections of said bottom portion having a longitudinal edge extending generally parallel to said longitudinal axis of said tubular barrel, said head and tubular barrel being connected by weld means between each of said longitudinal edges of said side section of said bottom portion of said head and said side wall of said tubular barrel.

4,601,484
IMPLEMENT PULLING HITCH ASSEMBLY

Robert S. Baker, R.R. 1, Alva, Okla. 73717, and Joe E. Sternberger, R.R. 1, Hardtner, Kans. 67057

Continuation-in-part of Ser. No. 544,944, Oct. 24, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 743,140
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—411 C 2 Claims



1. An implement pulling hitch assembly, comprising:

beam means including first and second rigid unitary elongated horizontally curved beams each having its respective end portions facing the same direction in spaced-apart relation, said second beam being hingedly connected by one of its end portions with one end portion of the first said beam for vertical pivoting movement of both beams with respect to each other about a horizontal axis;

coupling means at the hinged juncture of said beams and on the respective other end portion of said beams for connecting agricultural implements thereto;

tongue means including an elongated tongue adapted to be pivotally connected at one end portion with a tractor hitch and hingedly connected at its other end portion with one end portion of said beam means for horizontal pivoting movement with respect to each other about a vertical axis;

a plurality of ground engaging caster wheel means mounted on and horizontally supporting said beam means above the surface of the earth; and,

power means including a single pressure operated cylinder extending between and connecting the tongue with said one end portion of said first beam for horizontally pivoting said beam means about the vertical axis and moving said beam end portions from a laterally directed implement tandem travel position to a rearwardly directed implement laterally offset forward to rearward staggered soil planting position.

4,601,485
MECHANISM AND COUPLING PROCESS FOR LIFTING THE TAILGATE OF A PICK-UP TRUCK WHEN COUPLING WITH FIFTH WHEEL VEHICLES

John G. Furchak, P.O. Box 2138, Novato, Calif. 94948

Filed Apr. 24, 1985, Ser. No. 726,678
Int. Cl.[4] B62D *53/00*
U.S. Cl. 280—423 R 7 Claims

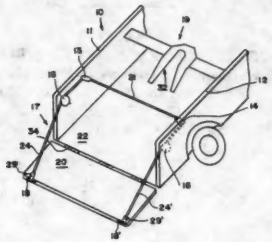
1. A mechanism for lifting the tailgate of a truck used to tow a Fifth Wheel vehicle, said truck having a Fifth Wheel mount, comprising in combination:

a Fifth Wheel Vehicle having a main body and a forward section, a pin box having a pin depending therefrom, said pin box being attached to the underside of said forward section of said Fifth Wheel Vehicle;

a truck having a tailgate and an open bed on which is mounted a Fifth Wheel mount, said truck having its rear end adjacent said Fifth Wheel Vehicle so that said open bed of said truck is positioned underneath said forward section of said main body of said Fifth Wheel Vehicle;

pulley means mounted on each side of said truck along an edge of said open bed, said pulley means being positioned between said Fifth Wheel mount and said tailgate;

cable means, each end of which is attached to an end of said tailgate, said cable means extending between one of said ends of said tailgate to and around the adjacent one of said pulley means, across said open bed of said truck to and around the other one of said pulley means and to the other end of said tailgate;

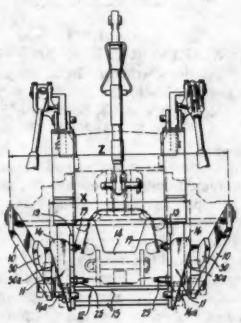


whereby as said truck is backed underneath said forward section of said Fifth Wheel Vehicle to engage said pin of said pin box of said Fifth Wheel Vehicle in said Fifth Wheel mount, said pin box engages said cable where it spans said open bed of said truck so that said tailgate is drawn toward a closed position as said pin box approaches said Fifth Wheel mount.

4,601,486
TRACTOR HITCH

Gilbert Marcq, Beauchamp, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Nov. 19, 1984, Ser. No. 672,658
Claims priority, application United Kingdom, Nov. 29, 1983, 8331824
Int. Cl.[4] A01B *59/043*
U.S. Cl. 280—460 A 6 Claims



1. A tractor hitch having a pair of lower implement attachment links pivotable in a vertical sense between a lowered working position and a raised transport position, a pair of sway blocks spaced transversely of the tractor with rubbing surfaces for cooperation with the links to control the amount of sideways sway of any implement attached to the links whether in their working or transport position, mounting means adjacent

one end of each sway block to mount the sway block on the tractor and including pivot means to allow the block to pivot in a generally transverse plane relative to the tractor, first adjustment means adjacent the other end of each sway block to allow the angle of pivot of the block to be continuously adjusted within a given angular range to provide adjustment of the amount of side sway of the links when in contact with said other ends of the sway blocks, and second adjustment means included in said mounting means to allow the transverse spacing between the pivot means of the sway blocks to be varied in order that the hitch can cater for different sizes of implement.

4,601,487

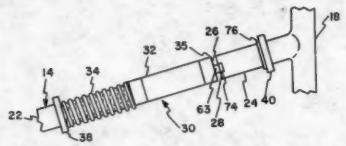
ACTUATOR FOR PROTECTIVE ROLL BAR

Harry W. Hoffman, 879 Heather Dr., San Carlos, Calif. 94070

Filed Nov. 13, 1984, Ser. No. 670,041

Int. Cl.[4] B60R *21/02, 27/00*

U.S. Cl. 280—756 **16 Claims**



3. In a motor vehicle having secured thereto a front hoop formed by a generally upright front member and an upright rear member joined by a horizontal top member, a protective roll bar comprising a first elongated tubular member pivotally attached to said front member, a second, relatively short tubular member rigidly connected to said rear member, said tubular members having spaced apart distal ends, the improvement comprising: an actuator comprising in combination:

(a) a slidable, tubular sleeve for engaging said distal ends of said first and second tubular members thereby forming a substantially continuous, disengageable, rigid protective roll bar;

(b) a first coil spring mounted over rear portion of said first tubular member in abutting contact with said tubular sleeve for urging said sleeve into slidable engagement with said second tubular member; and

(c) a releasable latching means fixedly mounted within the distal end of said first tubular member for locking securely together said tubular members.

4,601,488

SAILING SKI FOR USE ON SNOW AND ICE

Mark Jarrett, Mount Clemens, Mich., assignor to Evans Marine, Inc., Detroit, Mich.

Filed Dec. 6, 1984, Ser. No. 678,653

Int. Cl.[4] A63C *11/00*

U.S. Cl. 280—810 **7 Claims**

1. A sailing ski for use on snow and ice comprising:

a single elongated body in the form of a ski having substantially flat upper and lower surfaces and being wider than a conventional ski,

a universal mast mount for mounting a sailing assembly positioned toward the forward end of the elongated body,

said sailing assembly comprising a mast, transverse beams and a sail, said mast engaging said universal mast mount,

longitudinally spaced foot straps positioned rearwardly of the universal mast mount,

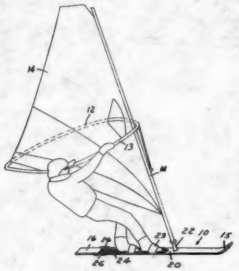
and a pair of longitudinally extending runners on the sides of the ski rearwardly of said foot straps, each runner having a lower edge projecting at least partly below the lower surface of the ski,

each runner including a forward end that extends upwardly and forwardly and a bottom edge that extends rearwardly from the forward end,

the forward end being flat in a transverse direction and the bottom edge tapered toward a centrally located free cutting edge symmetrical in cross section,

said ski having a camber along its lower surface and a substantially flat plastic covering along its lower surface with a plurality of longitudinally extending grooves therein

said ski having longitudinally spaced foot straps positioned



rearwardly of the universal mast mount, said straps overlying the camber area, each runner having a rear portion attached to the rear end of the ski adjacent the end of the camber area and a forward portion extending forwardly of the ski into the camber area,

the sides of the ski having an inwardly extending concave curve running the length of the ski.

4,601,489

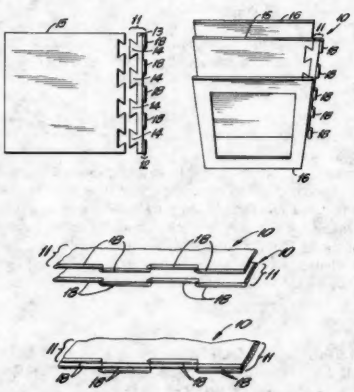
ALBUM DESIGN AND METHOD OF FABRICATION

Enzo Stancato, 33 Windy Knolls, Greenwich, Conn. 06830

Filed Jul. 26, 1985, Ser. No. 759,482

Int. Cl.[4] B42D *1/08*

U.S. Cl. 281—21 R **5 Claims**



1. An album design whose appearance is that of being a prebound structure but whose individual pages are capable of being selectively inserted or removed as desired so as to achieve an album of any desired size, said album comprising:

(a) pages capable of being selectively structurally interconnected with each other, each page comprising:

(i) a center core member formed to define along the binding portion thereof, symmetrical geometric recesses;

(ii) a first interconnecting spinal component fashioned to define tab members that are compatibly formed to structurally interfit with the symmetrical geometric recesses

of said center core, there also being formed, as part of said first interconnecting spinal component, a first interconnecting tubular array comprising of symmetrically positioned spine members

(iii) a first guide member shaped such that its dimensions are compatible with the dimensions of said center core member, said first guide member being structurally affixed to the front face of said center core member after the tab members of said first interconnecting spinal component are interfitted with the symmetrical geometric recesses of said center core thereby providing structural integrity to said page in addition to that provided by the interfit between said tab members of said first interconnecting spinal component and said symmetrical geometric recesses of said center core, and;

(iv) a second guide member shaped such that its dimensions are compatible with the dimension of said center core member, said second guide member being structurally affixed to the back face of said center core member after the tab members of said first interconnecting spinal component are interfitted with the symmetrical geometric recesses of said center core thereby providing structural integrity to said page in addition to that provided by the interfit between said tab members of said first interconnecting spinal component and said symmetrical geometric recesses of said center core;

(b) a front cover shaped to be compatible with said pages wherein there is structurally affixed along the interior portion and adjacent to the binding portion thereof a second interconnecting spinal component defining individual positioned spine members capable of mechanical interfit with said spine members of said first interconnecting spinal component of a page member; and

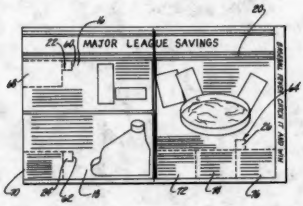
(c) a back cover shaped to be compatible with said pages wherein there is structurally affixed along the interior portion and adjacent to the binding portion thereof a third interconnecting spinal component defining individually positioned spine members capable of mechanical interfit with said spine members of said first interconnecting spinal component of a page member.

4,601,490

MULTI-COUPON SWEEPSTAKES PROMOTION VEHICLE

David A. Brandon, Plymouth, Mich., assignor to George F. Valassis & Company, Livonia, Mich.

Filed Oct. 13, 1983, Ser. No. 541,784
Int. Cl.[4] G09F 9/00; A63F 3/08
U.S. Cl. 283—56 **6 Claims**



1. A multi-page sweepstakes promotion vehicle comprising:

a description section containing graphics pertaining to the sweepstakes, including the official sweepstakes rules;

a sweepstakes entry blank including a game card having a plurality of spaces with each space bearing a graphic indicia of a specific product;

a multi-page region, separate from the portion of said vehicle containing said description section and said entry blank, containing a series a graphic descriptions of products;

a plurality of product stamps respectively associated with a plurality of products and each bearing a graphic indicia of the respective associated product; and

means detachably securing said stamps in spaced relation within said multi-page region with each stamp positioned within said multi-page region in respective proximity to the graphic description of the specific product associated with that stamp,

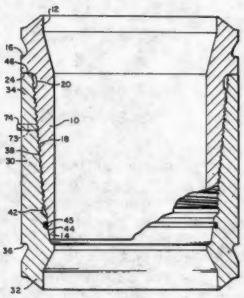
whereby, in order to complete the entry blank, the participant must search the multi-page region to locate the various product stamps located in spaced relation within the multi-page region corresponding to the specific products identified in the game card spaces, thereafter detach each of the located product stamps from their locations contiguous to the corresponding product descriptions, and thereafter affix the product stamps in the corresponding spaces located on the game card.

4,601,491

PIPE CONNECTOR

James L. Bell, Jr., Oak View; Mark T. Thatcher, Ojai, both of Calif.; Brian K. Phillips; Norman Brammer, both of Aberdeen, Scotland, and Thomas F. Sweeney, Ventura, Calif., assignors to Vetco Offshore, Inc., Ventura, Calif.

Filed Oct. 19, 1983, Ser. No. 543,590
Int. Cl.[4] F16L 35/00
U.S. Cl. 285—24 **14 Claims**



1. A snap connector for pipes comprising:

a cylindrical pin having a frustoconical outer surface, one end thereof securable to a pipe, and the other end open;

a cylindrical box having a frustoconical inner surface, one end securable to a pipe, the other end open, and telescopically engageable with said pin;

a first helical thread form on the outer surface of said pin;

a second helical thread form on the inner surface of said box;

each of said thread forms having a crest of discreet axial length, a rounded root, and an abutting flank facing away from the open end, the surface of each of said crests being said frustoconical surface of said pin and said box respectively;

each of said pin and box having a secondary radially extending surface facing toward the open end;

means for circumferentially aligning said pin and box for correct axial stabbing, such that the distance from said secondary radially extending surface of said pin to a point on an abutting flank of said pin equals the distance from said secondary radially extending surface of said box to a point on an abutting flank of said box at the same axial and circumferential location, whereby when fully engaged both the abutting flanks of the pin and box and the secondary radially extending surfaces are in axially compressive abutment; and

the width of said crests so related to the frustoconical taper that when stabbing in the circumferentially aligned position, initial contact is made radially between said crests of

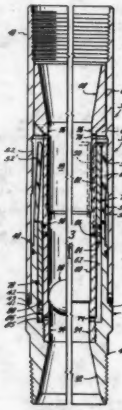
said first helical thread form and said crests of said second helical thread form, whereby the connector is forced into snap engagement without rotation.

4,601,492

RELEASABLE COUPLING

Flint R. George, Katy, Tex., assignor to Geo Vann, Inc., Houston, Tex.

Filed Oct. 20, 1982, Ser. No. 435,458
Int. Cl.[4] F16L *37/08*
U.S. Cl. 285—3 8 Claims



1. A ball actuated, releasable coupling apparatus which can be interposed within a tubing string for subsequently parting one length of the string from another, comprising:

a female member having an end adapted for attachment into an upper length of the tubing string;

a male member having an end adapted for attachment into a lower length of the tubing string;

a lower length of said female member and an upper length of said male member being of relative diameters which permits telescopingly joining one within the other;

a sleeve connected to a lower portion of said male member and extending upwardly in spaced relationship with respect to said upper length of said male member;

a releasing piston having an outer surface for slidably engaging the inner surface of said male member and an inner surface for slidably engaging the outer surface of said sleeve, said piston being movable from a first postion to a second position;

said female member, said male member, said releasing piston and said sleeve being concentrically arranged with respect to one another, there being an axial passageway through said female member, said male member, said releasing piston and said sleeve, said releasing piston being slidably received within at least a portion of said lower length and upper length, respectively, of said female and male members, respectively;

a plurality of circumferentially spaced, upwardly extending fingers formed in said upper length of said male member, said outer surface of said releasing piston bearing against the inner surface of said fingers to secure said fingers against a medial length of said female member when said piston is in said first position;

the outer surface of said fingers and said medial length of said female member having coacting teeth formed thereon which mutually engage one another;

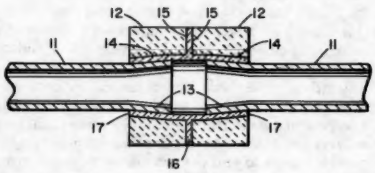
said piston allowing said fingers to resistingly move inwardly towards one another when said piston is in said second position such that the teeth become disengaged from one another, whereupon said male and female members slide apart from one another, thereby releasing said male and female members from one another.

4,601,493

ELECTRICALLY-ISOLATING COUPLER SUITABLE FOR HIGH PRESSURE CRYOGENIC GAS FLOW

Oakley G. Ross, Upland; Mark L. Kline, Fullerton, and Larry D. Wedertz, Mira Loma, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Apr. 13, 1984, Ser. No. 600,070
Int. Cl.[4] F16L *11/12, 25/00;* C03C *27/02*
U.S. Cl. 285—53 10 Claims



1. A coupler for electrically isolating two conductive sections of fluid-passing line, which comprises;

two nonconductively-interconnected pieces of tubing for insertion between the sections of line, the pieces each having a divergently-flared end; and

two dielectric wafers, each wafer having both a tapered hole extending through it that matches the flared ends and a corresponding face to which the larger end of the tapered whole extends;

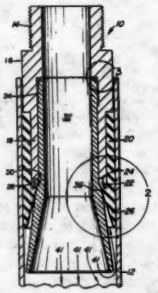
the flared ends being each bonded within a separate one of the tapered holes in a position recessed from the corresponding face with the flare of the end paralleling the taper of the hole, and the faces being bonded together with the larger ends of the tapered holes aligned and the flared ends sealed in fluid communication with an electrically-nonconductive gap between them.

4,601,494

NIPPLE INSERT

Roderick D. McLeod, 5104 125th Street, Edmonton, Alberta, Canada (T6H 3V5)

Filed Mar. 24, 1983, Ser. No. 478,365
Claims priority, application Canada, Apr. 5, 1982, 400445
Int. Cl.[4] F16L *17/00*
U.S. Cl. 285—110 2 Claims



1. A nipple for use in a bypass tool, said nipple comprising:

(a) a tubular body with a threaded upper end for securing the

nipple into said tool and a lower end of reduced outer diameter;

(b) a resilient sleeve molded on said reduced outer diameter of said nipple lower end and providing a bonding area therebetween, said resilient sleeve providing a seal between the exterior of said nipple and a well tubing;

(c) an inner groove on the lower end of said nipple;

(d) said resilient sleeve having a skirt portion on the lower end thereof defined by an inner frusto-conical portion, and a flange on the top end of said skirt portion, said flange having an outwardly directed lip received in said annular groove of said nipple; and

(e) a tubular insert coaxially located and secured on the inside of said nipple, said insert having an outer bevelled shoulder portion sealingly engaging the top end of said skirt portion of said resilient sleeve and forcing said lip thereof into said annular groove of said nipple to prevent high pressure in said tool from reaching said bonding area between said resilient sleeve and the outer surface of the nipple body;

(f) said frusto-conical skirt portion of said resilient sleeve defining a peripheral space between the inner surface of said skirt portion and the adjacent, outer surface of the tubular insert so that pressure flowing through the nipple forces the skirt portion outwardly into a firmer sealing engagement with said tubing.

4,601,495

PIPELINE SYSTEM AND METHOD OF ASSEMBLY

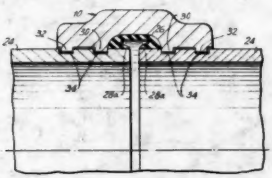
Maurice J. Webb, Mountain Lakes, N.J., assignor to Victaulic Company of America, South Plainfield, N.J.

Continuation of Ser. No. 371,438, Apr. 23, 1982, Pat. No. 4,522,434. This application Jun. 7, 1985, Ser. No. 742,719

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[4] F16L *17/04*

U.S. Cl. 285—112 **10 Claims**



1. In combination:

a conduit member of a conduit system;

said conduit member having plural axially spaced key receiving engagement members adjacent at least one end thereof, each said engagement member being formed of ductile material;

a segmented coupling embracing and secured to said end of said conduit member, said coupling including:

plural arcuate members each providing an internal recess, each said member being comprised of a substantially unfinished high-strength casting of a material having substantial ductility, at least one portion of each said arcuate member extending axially to one side of said internal recess;

a gasket positioned within said recess;

securing means securing said arcuate members in encircling engagement with said conduit member, with said gasket in continuous sealing engagement with said one end of said conduit member; and,

plural axially spaced continuous arcuate keys integral with and extending inwardly of the inner periphery of said axially extending portion of each said arcuate member;

said keys respectively being spaced axially correspondingly with said engagement members of said conduit member and each being engaged with the engagement face of a said engagement member, said keys resisting relative axial movement between said coupling and said conduit member when under axial loading;

each said key having a substantially unfinished engagement face having an inversely pebbled surface produced in the casting of the associated segment and which faces towards said internal recess, and, which is engaged with a radially extending engagement face of an associated engagement member, said engagement faces of said keys and said engagement members lying substantially radial and perpendicular to the axis of generation of the associated arcuate member, said inversely pebbled surface of said engagement face of each said key being capable of crushing down and cold working the associated engagement member of said conduit member, to provide substantially uniform distribution of the stresses imposed upon said keys when said keys are subjected to axial loading.

4,601,496

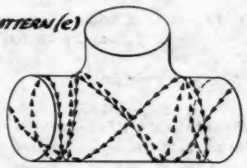
FIBER REINFORCED PLASTIC PIPE TEE

Ronald G. Ulrich, Burbank, and Ralph S. Friedrich, Hermosa Beach, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Filed Sep. 11, 1980, Ser. No. 186,335

Int. Cl.[4] F16L *41/00, 47/00*

U.S. Cl. 285—156 **53 Claims**



1. A fiber reinforced plastic pipe tee having a straight run and a side branch comprising:

a plurality of laminations of essentially continuous reinforcing fiber roving bonded together by a synthetic resin, including at least some layers of tape having a weft of parallel reinforcing fibers and a warp of carrier fibers for maintaining the reinforcing fibers substantially parallel to each other, the reinforcing fibers having ends embedded beneath fiber rovings adjacent the outside surface of the tee.

4,601,497

SWIVELABLE QUICK CONNECTOR ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Southfield, Mich.

Continuation-in-part of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Mar. 22, 1982, Ser. No. 360,201

Int. Cl.[4] F16L *37/12*

U.S. Cl. 285—319 **27 Claims**

1. A swivelable connector assembly for providing a snap-action quick connection, comprising:

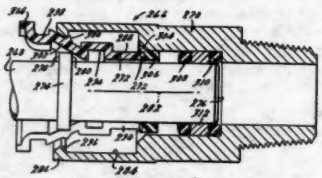
a tubular conduit adapted to convey fluid and formed with an annular projection disposed a predetermined distance from the end of said conduit to be connected;

a housing formed with an axial bore for receiving said conduit at a first end and for providing a fluid path at a second end, said housing including an inwardly extending annular lip at said first end;

sealing means disposed within said axial bore for providing a fluid tight seal between confronting portions of said conduit and said housing;

retainer means, disposed generally within an enlarged diameter portion of said axial bore of said housing and detach-

ably secured to said housing at said first end, for cooperating with said annular projection of said conduit to secure said conduit in its operative position within said axial bore of said housing, said retainer means including at least two circumferentially spaced resilient radially deformable leg members extending from an integral collar member at one end thereof, each of said leg members having an outwardly opening channel portion adapted to receive said inwardly extending annular lip of said housing for securing said retainer means to said housing and an inwardly



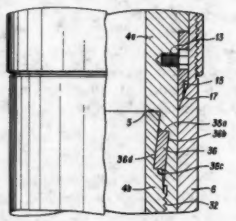
opening channel portion adapted to receive said annular projection of said conduit for securing said conduit in its operative position within said axial bore of said housing, said leg members of said retainer means being adapted to deform radially outwardly into said enlarged diameter portion of said bore means in response to the insertion of said conduit into said axial bore of said housing and through said collar member of said retainer means and permit said annular projection of said conduit to snap into said inwardly opening channel portion of each of said leg members.

4,601,498

DEFORMABLE METAL-TO-METAL SEAL

David M. Haugen, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Nov. 15, 1982, Ser. No. 441,459
Int. Cl.⁴ F16L *25/00*
U.S. Cl. 285—332.3 **5 Claims**



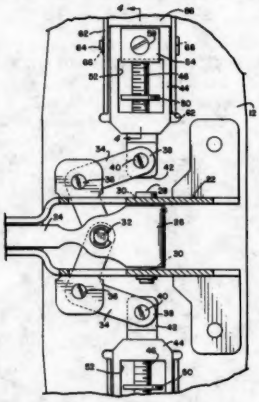
1. A metallic threadable connection for use in a subterranean well tool comprising first and second threadably interengagable cylindrical members, one said member defining a threaded pin portion and the other member defining a threaded box portion; a non-threaded, axially extending peripheral surface on each cylindrical member; said surfaces being respectively formed adjacent said threaded pin and box portions and disposed in opposed, radially spaced apart relationship when said pin and box portions are fully threadably engaged; opposed transverse surfaces respectively formed on each of said first and second cylindrical members movable axially toward each other during threaded engagement of the pin and box portions; said peripheral surfaces and said transverse surfaces defining an annular cavity having a quadrilateral cross-section when said cylindrical members are fully threadably engaged; an annular, nonresiliently deformable, tubular sealing member freely mounted in telescopic relation to both of said axially extending peripheral surfaces when inserted intermediate said transverse surfaces prior to full threadable engagement of said cylindrical members, whereby the completion of the threaded engagement of said cylindrical members deforms said deformable sealing member to conform to said annular cavity and establish sealing integrity between the interior and exterior of the threadably interconnected pin and box portions along said transverse surfaces; one of said axially extending peripheral surfaces on said pin portion and said box portion being acutely inclined relative to the axis of said cylindrical members in a direction to produce an interference with the deformed sealing member when said cylindrical members are relatively rotated in a thread disengaging direction, whereby said deformed sealing member maintains sealing integrity along said one axially extending peripheral surface during initial disengagement of the threaded connection.

4,601,499

OPERATING MECHANISM FOR A CLOSURE LATCHING ASSEMBLY

Kun H. Kim, Indianapolis, Ind., assignor to Von Duprin, Inc., Indianapolis, Ind.

Filed Jul. 3, 1984, Ser. No. 627,722
Int. Cl.⁴ E05C *1/12*
U.S. Cl. 292—36 **14 Claims**



1. An operating mechanism for a closure latching assembly, comprising:

a support plate, having a longitudinal axis, for mounting thereof onto an external surface of a closure, such as a door, gate, bulkhead, or the like; wherein

said plate also has an inner, closure-interfacing and closure-engaging surface, and an outer, opposite, support surface;

an elongate, latch bolt-actuating element; an

attachment block;

means coupling said block, slidably, to one of said surfaces to accommodate movement of said block axially of said plate; and

means attaching said element removably to said block, in a given disposition relative to said block, for movement of said element in common with said block; wherein

said attaching means includes adjusting means, accessibly disposed on said outer, support surface, selectively movable, relative to said block, for effecting relative movement, between said element and said block, for adjustably positioning said element, relative to said block, in selected dispositions other than said given disposition; and

said adjusting means, said block, and said element have means mutually cooperative for causing relative movement between said element and said block coincident with movement of said adjusting means relative to said block;

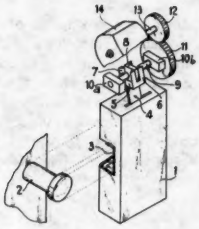
said block has a cavity formed therein; said element has a limb disposed in said cavity; and said adjusting means comprises an adjustment screw engaged with said block which (a) protrudes into said cavity, and (b) engages said limb.

4,601,500

RELEASABLE COUPLING FOR ELECTRICAL VEHICLE-LATCH MECHANISM

Vincent Bernard, Anould, France, assignor to Compagnie Industrielle de Mecanismes en abrege C.I.M., France

Filed Feb. 15, 1985, Ser. No. 702,559
Claims priority, application France, Feb. 17, 1984, 84 02444
Int. Cl.⁴ E05C *3/26*
U.S. Cl. 292—201 **18 Claims**



1. A coupling engaging and releasing device, in particular for an electric locking mechanism of a latch for a motor vehicle door, said device comprising a support, a driving element mounted on the support to be movable along an axis, a receiving element, coupling engaging and releasing means which are attached to the receiving element and are capable of being driven by the driving element and the receiving element from a locking position to an unlocking position and vice-versa, the coupling engaging and releasing means comprising at least two resilient strips, at least one wedge carried on each of said strips, said wedges being symmetrical relative to a plane of symmetry which intersects said axis of movement of the driving element and passes through the driving element and each wedge having a planar surface which is parallel to said plane and faces toward said plane, and a ramp which is inclined to said plane and faces away from said plane, said strips being disposed in such manner as to be capable of being coupled to the driving element by one of said planar surfaces which are parallel to said plane of symmetry so as to drive the receiving element from said locking position to said unlocking position and vice-versa, by resiliently moving away from the driving element so as to assume an uncoupled position in one of said locking and unlocking positions.

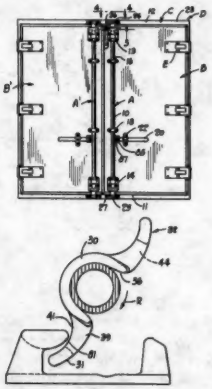
4,601,501

DOOR CONTROL MECHANISM

John V. Pastva, Parma Heights, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Nov. 21, 1984, Ser. No. 673,675
Int. Cl.⁴ E05C *9/08*
U.S. Cl. 292—218 **9 Claims**

1. A door control mechanism of a type used to latch a pivoted door in a closed position, said mechanism comprising a keeper member adapted to be secured to a door frame adjacent an edge portion that extends transversely to the pivot axis of a pivoted door, a shaft adapted to be secured to such a door with its longitudinal axis spaced from and parallel with the pivot axis of the door, a latch member secured to an end of said shaft and cooperable with said keeper member for securing the door to which the shaft may be attached in a closed position, means for securing said shaft to the door so that the shaft can turn about its longitudinal axis, means connected to the shaft for turning it about said axis, said latch member having a U-shaped body portion partly surrounding the end of said shaft to which it is attached and portions projecting in generally opposite directions transversely of said shaft, each projecting portion having outwardly facing surfaces that converge in a direction away from said body portion and at least one projecting portion having an aperture beginning at the U-shaped body portion, elongated in the direction the projecting portion extends, said aperture being widest adjacent the U-shaped body portion and having spaced opposed walls converging in a direction away from the body portion at substantially the same angle as said outwardly facing surfaces and also converging in a transverse direction, and said keeper member having a base portion for attachment to a door frame or the like and two spaced portions extending outward from the base portion and constructed and arranged to be engaged by the projecting portions of the associated latch member when said shaft is turned to a



latching position, both of said spaced extending portions having side surfaces that converge, but in opposite directions, one of said spaced extending portions of said keeper member having a latch member retaining wall extending laterally of the converging side surfaces of the said one spaced extending portion and spaced from the base portion and provided with a convex surface portion facing the base portion, adapted to engage one projecting portion of the associated latch member when the latch and keeper members are engaged and thereby prevent pivoting of the door, the other of said projecting portions being tapered outward from the base portion along said converging side surfaces, both of said projecting latch member portions and both of said keeper extending portions serving to inhibit relative shifting of the door and frame in the plane of the door when the latch member and keeper are engaged.

4,601,502

DOOR STOP ASSEMBLY

James R. Van Dyke, P.O. Box 2638, Redwood City, Calif. 94064

Filed May 6, 1985, Ser. No. 730,787
Int. Cl.⁴ E05C *1/16*
U.S. Cl. 292—252 **12 Claims**

1. A door stop assembly for installation in a floor having a floor surface over which a door may swing along an arcuate door path, said door stop assembly comprising:

an elongated tubular housing for vertically mounting in the floor, said housing having an open first end positioned proximate said floor surface, and a closed second end;

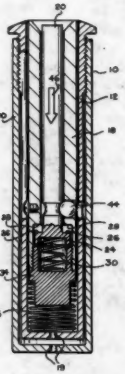
an elongated tubular door check rod longitudinally movable within said tubular housing between a retracted first position wherein a first end of said check rod is positioned proximate said floor surface and an extended second posi-

tion wherein said first end is substantially above said floor surface and in the arcuate door path;

biasing means disposed within said housing for urging said tubular door check rod from said first position to said second position;

locking means coupled between said tubular housing and said tubular door check rod; and

a trigger bar coupled to said locking means for selectively unlocking said locking means, said trigger bar having first and second ends, said trigger bar being longitudinally



movable between first and second operating positions within said tubular door check rod, in said first operating position the first end of said trigger bar is positioned proximate the first end of said door check rod and said door check rod is locked in its retracted first position by said locking means, in said second operating position the first end of said trigger bar is recessed below the first end of said door check rod and said door check rod is unlocked by said trigger bar to move to its extended second position.

4,601,503

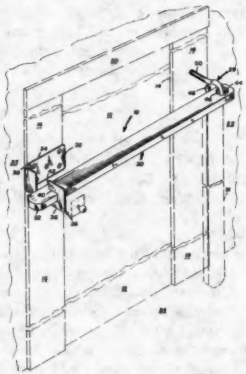
DOOR SECURITY DEVICE

Jerome L. Wicks, Sr., 3401 Rockdale Ct., Baltimore, Md. 21207

Filed Oct. 17, 1983, Ser. No. 542,488

Int. Cl.[4] E05C *19/00*

U.S. Cl. 292—259 R **6 Claims**



1. A security device, comprising:

an enclosure, said enclosure having an interior and an exterior and an aperture-like opening therein, said aperture-like opening in said enclosure communicating said interior of said enclosure with said exterior thereof, said aperture-like opening having a covering means, said covering means requiring protective security measures thereon;

a first retaining means, said first retaining means having an integral and monolithic fastening means thereon, said integral and monolithic fastening means affixing said first retaining means to said interior of said enclosure at said aperture-like opening therein, said first retaining means having a first portion and a second portion, said first portion being integral and monolithic with said second portion, said first portion including an eye portion of generally circular configuration, said second portion of said first retaining means being screw threaded in configuration, said first retaining means being screw-eye-like in general configuration, said screw threaded second portion of said first retaining means suitably affixing said first retaining means in place of said aperture-like opening;

a second retaining means, said second retaining means having a first portion and a second portion, said first portion of said second retaining means including a hinge affixed to said second portion thereof, said second portion including a hinged edge and a top edge transverse to said hinged edge, said second retaining means being hasp-like in general configuration, said first portion of said second retaining means having a plurality of apertures therein and therethrough, said plurality of apertures in said first portion of said second retaining means being suitable for affixing said second retaining means to and at said aperture-like opening, said second portion of said second retaining means having an elongated "L" shaped slot therein and therethrough, said slot comprising a first upstanding leg intersecting said top edge and a second leg transverse to said first leg;

a bar-like member, said bar-like member being pivotally affixed to said first retaining means so as to be pivotable in more than one axis of direction and removably affixed to said second retaining means, said bar-like member having an aperture in and through and spaced from one end thereof, said eye portion of said first retaining member being the means of pivotally affixing said bar-like member thereto through said aperture therein, said "L" shaped slot in said second portion of said second retaining means being oriented horizontally to receive said bar-like member so that said bar-like members cross-sectional long axis is horizontal in said horizontally oriented "L" shaped slot, said bar-like member having a cross-sectional configuration that can be removably inserted into said elongated "L" shaped slot, said bar-like member being oriented in said "L" shaped slot so as to be in a maximum strength position in relation to said covering means, said bar-like member having a length; and

a plurality of fastening means, said plurality of fastening means affixing said second retaining means to said interior of said enclosure at said aperture-like opening therein, said plurality of fastening means being inserted in and through said plurality of apertures in said first portion of said second retaining means to affix said second retaining means to and at said aperture-like opening.

4,601,504

SAFETY MECHANISM FOR HIGH SECURITY LOCK

Ralph C. Wolf, Yorba Linda, Calif., assignor to Major Lock, Corp., Anaheim, Calif.

Filed Apr. 23, 1984, Ser. No. 603,037

Int. Cl.[4] E05C *1/16*

U.S. Cl. 292—334 **9 Claims**

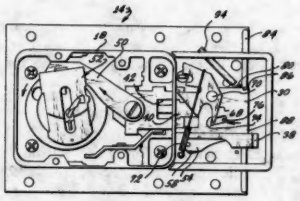
1. In combination with a high security lock, said lock for locking a first component to a second component, said lock having a lock base attaching to said first component, a lock bolt, a primary unlocking mechanism for moving said lock bolt

from a locked position to an unlocked position, a relock means for returning said lock bolt from said unlocked position to said locked position after unlocking said lock, and a strike attaching to said second component, said lock bolt engaging said strike to lock said first component to said second component and releasing from said strike to unlock said first component from said second component, wherein the improvement comprises:

said lock base including a bolt opening, said lock bolt located in association with said opening;

said bolt movably mounted on said base in association with said bolt opening so as a strike engaging portion of said bolt extends out of said bolt opening to a locked position and said strike portion of said bolt is retracted through said opening onto said base in an unlocked position;

said means for returning said locked bolt from said unlocked position to said locked position comprising means



mounted on said lock base for interacting with said strike when said first component is moved from an open position with respect to said second component to a closed position with respect to said second component;

lock prevent means movably mounted on one of said lock bolt and said base and operatively associated with the other of said lock bolt and said base, said lock prevent means movable on said one of said lock bolt and said base on which it is mounted so as to move between a first position and a second position, said lock prevent means in said first position engaging the other of said lock bolt and said base with which it is associated so as to prevent said relock means from moving said lock bolt from said unlocked position to said locked position, said lock prevent means in said second position allowing said relock means to move said lock bolt from said unlocked position to said locked position.

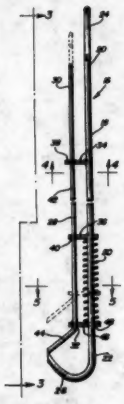
4,601,505

INDUSTRIAL SAFETY PULL HOOK

Moir E. Chilton, Rte. #1, Box 85, Ararat, N.C. 27007

Filed Aug. 16, 1984, Ser. No. 641,218
Int. Cl.⁴ B65G 7/12
U.S. Cl. 294—26 **8 Claims**

1. A safety pull hook for engaging and pulling items safely from a remote location, said pull hook including an elongated shank including a first handle end and a second hook end including a rigid reversely turned and inclined hook defining terminal end projecting outwardly to one side of said shank, said shank including mounting means thereon intermediate said handle end and said book end defining a guide passage closely spaced outward from and paralleling said one side, an elongated pull member paralleling said shank and supported from said guide means for lengthwise reciprocation through said passage, a first end of said pull member corresponding to said first handle end including a finger-engageable portion for manually engaging said pull member first end and lengthwise displacing said pull member in a first direction away from said hook, the second end of said pull member corresponding to said second hook end including a laterally outwardly inclined end member thereon projecting outwardly from said one shank side, opposing said hook defining terminal end and being oppositely inclined relative to said terminal end, spring means operatively connected between said pull member and shank yieldingly biasing said pull member in said second direction, said inclined end member and said inclined terminal end being equally oppositely inclined relative to a plane disposed substantially normal to said shank, whereby a lateral force directed upon said second hook end to displace the latter in a direction opposite to the direction to which said one side faces, while a



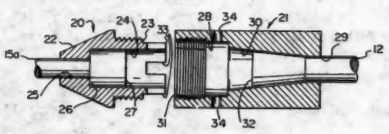
handle engaged by said pull hook is disposed immediately inwardly of the free ends of said end member and terminal end, will allow said handle to wedge between said free ends and cause said pull member to shift in said first direction against the biasing action of said spring means sufficient to allow said handle to slip outwardly between said free ends.

4,601,506

CABLE COUPLER FOR TREE SKIDDING CABLES

Murray G. Hillson, P.O. Box 2932, Salmon Arm, British Columbia, Canada (V0E 2T0)

Filed Jun. 6, 1985, Ser. No. 741,837
Claims priority, application Canada, Apr. 26, 1985, 480190
Int. Cl.⁴ B66C 1/14
U.S. Cl. 294—82.14 **14 Claims**



1. A cable coupler for tree skidding cables comprising first and second generally cylindrical parts, each having an orifice extending axially therethrough for accommodating a cable ferrule and each said orifice being of circular cross-section and having constricted region of smaller diameter than the largest diameter of the cable ferrule to be located therein, said parts being coaxially threadedly engageable with one another by means of complementarily formed sets of male and female threads respectively formed adjacent the extremities of said parts remote from said constricted regions of said orifices, at least one of said orifices and its associated ferrule being of circular cross-section to permit relative swivelling between the cables being joined.

4,601,507

FIBER OPTIC CABLE GRIP

David E. Fallon, Pawcatuck, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Division of Ser. No. 485,322, Apr. 15, 1983, Pat. No. 4,514,005. This application Apr. 1, 1985, Ser. No. 718,287

Int. Cl.[4] F16L *3/00*

U.S. Cl. 294—86.42 **8 Claims**

1. A grip for pulling fiber optic cable including an optical fiber core, a strength member located adjacent the core and an outer jacket enclosing the strength member with an exposed end of the strength member extending therefrom, the combination comprising:

a hollow member having a lead end and a tail end;

a pulling eye coupled to said hollow member lead end;

a wire mesh sleeve coupled to said hollow member at said tail end thereof and adapted to receive the fiber optic cable therein and grip the outer jacket thereof; and

coupling means, coupled to said hollow member, for coupling the exposed end of the strength member to said hollow member for increased support during pulling,

said coupling means comprising a loop to which the strength member is tied.

4,601,508

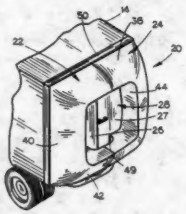
STREAMLINING APPENDAGE FOR VEHICLES

Paul D. Kerian, 317 Northwestern Dr., Grand Forks, N. Dak. 58201

Filed Jun. 18, 1984, Ser. No. 621,801

Int. Cl.[4] B62D *35/00*; B60V *1/00*

U.S. Cl. 296—1 S **23 Claims**



1. A streamlining appendage for the rearward end of a vehicle having a generally flat upright rearward surface, comprising, an inflatable upright peripheral body defining and surrounding

a rearwardly open plenum chamber, said body having

a generally flat upright front wall having a top edge, bottom edge and opposite side edges,

a top wall which extends rearwardly and downwardly from said top edge,

a pair of opposite side walls which extends rearwardly and transversely inwardly from said opposite side edges, and

a top inner wall and pair of opposite side inner walls connected to and extended between said front wall, top wall and side walls to at least partially define the inflatable peripheral body outwardly of said inner wall and said plenum chamber inwardly of said inner wall,

means for directing a source of air into said plenum chamber for escape through the open rearward end of said plenum chamber, and

said peripheral body having forward and rearward ends, being relatively thick at the forward end and tapering rearwardly therefrom with decreasing thickness.

4,601,509

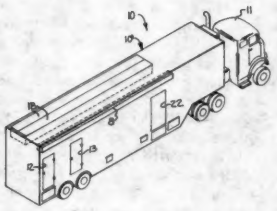
MOBILE KITCHEN AND CAFETERIA UNIT

William L. Ellis, Sr., P.O. Box 3509, Wilson, N.C. 27893

Filed Feb. 1, 1985, Ser. No. 697,268

Int. Cl.[4] B60P *3/02*

U.S. Cl. 296—22 **9 Claims**



1. A combination mobile kitchen and cafeteria unit which may be readily moved considerable distances for the serving of meals to a large number of patrons at a desired distal location, said mobile unit comprising:

an elongate wheeled walled enclosure having ingress and egress patron passageways positioned along a common side wall of said enclosure with the passageways being spaced from each other along the common side wall for accommodating patrons entering and leaving the enclosure in the serving of food thereto,

means defining a patron serving aisle within said enclosure for patrons to walk along, said aisle extending alongside of said common side wall and communicating with and extending between said ingress and egress passageways so that the traffic flow of patrons moving along the aisle is one-way and toward the egress passageway,

food and beverage serving means positioned along the side of said patron serving aisle opposite the side of the aisle along which the common side wall extends and being readily accessible to patrons moving along said aisle for partaking of the served food and the beverages,

means defining food and beverage storage and preparation means within said enclosure and extending alongside a side wall opposite from said common side wall along which said ingress and egress passageways are positioned and thus being so located as to be readily accessible to said food and beverage serving means for permitting attendants to prepare and supply food and beverages to said food and beverage serving means without interference with patrons moving along said aisle, said food and beverage storage and preparation means including;

cooking means for cooking food,

cooling means for maintaining food to be prepared in a cooled condition, and

sink means connected to a suitable source of water for the washing of the food attendants' hands and the washing of the food in the preparation for the cooking thereof,

electrical lighting means positioned at predetermined locations within the wheeled walled enclosure for illuminating the interior of said wheeled walled enclosure; and

air circulating means carried by said enclosure and arranged to deliver fresh air from outside the enclosure to within the enclosure and to exhaust foul air and fumes from the area of food preparation.

4,601,510

FRONT BODY STRUCTURE FOR MOTOR VEHICLE

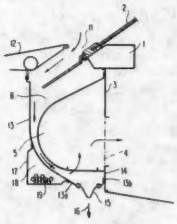
Roman Schöppel, Sindelfingen; Manfred Mordaü, Wildberg, and Gerhard Burk, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,536

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1984, 3401127

Int. Cl.⁴ B62D *31/00*

U.S. Cl. 296—194 **3 Claims**



1. A front body structure for motor vehicles, with an end wall and with an equipment space which is located in front of the end wall in the engine space and is partitioned off from the engine space and which is covered on top of an engine hood,

a heating air-conditioning air-passage orifice for a blower located in the equipment space, the air-passage being in the central region of the end wall, spaced partition walls connected to the end wall on both sides of the air-passage orifice and extending approximately in the longitudinal direction of the vehicle for dividing the equipment space into a central space and two lateral spaces, one each located on the right and left of the central space, wherein only the central space communicates at the top with the free atmosphere via a gap between the rear end of the engine hood and the windshield, for sucking in air for the heating air-conditioning system,

a hollow girder means formed by means of a half-shell attached to the side facing the engine space of a front transverse wall of the central space for connecting the two lateral spaces of the equipment space to receive communicating lines.

4,601,511

ROOF STRUCTURE WITH REINFORCEMENT THEREFOR FOR AUTOMOTIVE VEHICLE

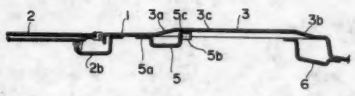
Yoshiharu Nakamura, Atsugi, and Ryuji Nishimiya, Hiratsuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 8, 1983, Ser. No. 512,017

Claims priority, application Japan, Jul. 13, 1982, 57-121686

Int. Cl.⁴ B62D *25/06*; E04C *2/32*

U.S. Cl. 296—210 **7 Claims**



1. A reinforced roof structure for an automotive vehicle comprising:

a roof frame rigidly defining the edges of the roof;

a roof panel supported by the roof frame;

a sun-roof including a sun-roof frame defining a sun-roof opening;

at least one reinforcement rib formed in the roof panel and extending longitudinally, said reinforcement rib having a rear end supported by said roof frame and having a front end located at an intermediate portion of the roof panel adjacent a lateral section of said sun-roof frame and terminating at a predetermined distance from said lateral section, said rib being formed with said front end tapering to a substantially horizontal planar surface of the roof panel; and

a laterally extending stiffener disposed substantially parallel to said lateral section of said sun-roof frame and attached to the intermediate portion of the roof panel opposing said front end of said reinforcement rib for reinforcing said front end, said stiffener being formed separately from said sun-roof frame and having a forward edge and a rear edge, said forward edge being substantially planar and attached to said substantially horizontal planar surface of said roof panel at a position adjacent to said lateral section of said sun-roof frame but spaced therefrom by a predetermined distance, said rear edge having a raised portion conforming to said reinforcing rib.

4,601,512

OPEN ROOF-CONSTRUCTION FOR A VEHICLE

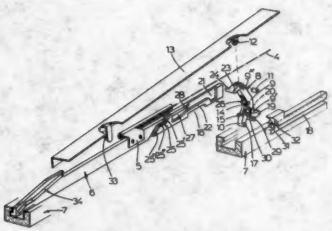
Robert T. Boots, Haarlem, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., Netherlands

Filed Apr. 10, 1984, Ser. No. 598,570

Claims priority, application Netherlands, May 6, 1983, 8301608

Int. Cl.⁴ B60J *7/00*

U.S. Cl. 296—221 **15 Claims**



1. An open roof construction for a vehicle having a roof opening comprising:

a panel for closing said roof opening and having a front side, said panel having a closed position, and being movable from said closed position to a rearwardly and downwardly inclined position, and from said inclined position to an at least partially opened position under a fixed roof, said panel being returnable from said opened position to said closed position while furthermore the panel can be moved from the closed position to a rearwardly and upwardly inclined ventilation position and from this ventilation position can be moved back again to the closed position;

a stationary, substantially horizontal rail with a longitudinal horizontal guide slot with a guide front end;

a slide-plate movably engaged by said horizontal rail, and having a horizontal guide slot;

a first transversally extending pivot shaft disposed at a preselected distance from said panel front end for displaceable supporting said panel;

a slide-plate connection means for interconnecting said slide plate and said panel, said slide-plate connection means having a link means with two legs, one of said legs having an upper part pivotably engaging said first shaft; a lower part carrying a guide pin which engages said guide slot in said slide plate, said guide slot having a rear end engaged by said guide pin when said panel is in the ventilation position and a front end which is abutted by said guide pin when said panel is in said rearwardly and downwardly inclined position; a second transverse pivot shaft for pivotably connecting the other leg of said link means to the one leg at a position intermediate between said upper and lower parts;

said second leg having a lower part carrying a guide peg extending in a direction facing away from said slide-plate, said guide peg being engaged by said stationary guide slot, said guide peg remaining in contact with said guide front end while said panel is moved from the closed to said rearwardly and downwardly inclined position, said guide peg moving rearwardly in said guide slot while said panel is moved rearwardly from said inclined position, wherein a lower part of said one leg is disposed rearwardly from the lower part of the other leg, a portion of said one leg between said leg lower part and said second shaft forming an angle with said other leg which is at a maximum in the rearwardly and downwardly position of the panel and which is at a minimum in the ventilation position of the panel; and

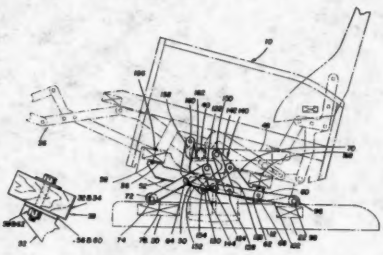
a pull-push means engaging said slide plate for moving said panel.

4,601,513

ROCK-BLOCKING MECHANISM FOR ROCKING CHAIR

James J. Pine, Tupelo, Miss., assignor to Action Industries, Inc., Tupelo, Miss.

Filed May 17, 1985, Ser. No. 735,369
Int. Cl.[4] A47C 3/02
U.S. Cl. 297—270 **22 Claims**



1. A rock-blocking mechanism for a rocking chair having a forwardly/rearwardly rockable rocker frame to left and right sides of which are respectively mounted left and right side linkages interconnected by a transversally extending torque tube journalled in said side linkages for reversible angular rotation in one and opposite directions about its own longitudinal axis, respectively for extending and retracting an ottoman mounted to respective links of said left and right side linkages, said rock-blocking mechanism comprising:

a mounting link constructed and arranged to be mounted to said rocker frame at least approximately medially thereof, intermediate said left and right side linkages;

a front landing gear pivotally secured intermediate forward and rear ends thereof to said mounting link at a forward site on said mounting link, by first horizontally, transversally extending pivot joint means;

a rear landing gear pivotally secured intermediate forward and rear ends thereof to said mounting link at a rear site on said mounting link, by second horizontally, transversally extending pivot joint means;

toggle link means pivotally interconnecting said rear end of said front landing gear with said front end of said rear landing gear respectively by means of third and fourth horizontally, transversally extending pivot joint means, said toggle length means being sufficiently long as to permit said front and rear landing gear to be pivoted about said first and second pivot joint means between a first, raised condition in which the front end of the front landing gear and the rear end of the rear landing gear are disposed sufficiently above respective forward and rear datum planes at which, in use, respective upwardly facing fixed support surfaces can be expected to be located as to permit a substantial amount of forward and rear rocking of said rocker frame relative to said fixed support surfaces, and a second, lowered condition in which the front end of the front landing gear and the rear end of the rear landing gear are disposed in said forward and rear datum planes;

a generally vertically-oriented lift link having a lower end pivotally secured by fifth horizontally, transversally extending pivot joint means to one of said front and rear landing gears between said first and second horizontally, transversally extending pivot joint means so that said lift link may be lifted to lower said front and rear landing gear to said lowered condition and lowered to raise said front and rear landing gear to said raised condition;

a generally L-shaped bell crank link having first and second legs with respective inner ends joined at a crux;

a sixth horizontally, transversally extending pivot joint means pivotally joining said bell crank link to said mounting link intermediate the longitudinal extent of said mounting link;

a seventh horizontally, transversally extending pivot joint means pivotally joining said first leg of said bell crank link distally of said crux to said lift link distally of said lower end of said lift link;

a series of pivotally interconnected links constructed and arranged to be secured at one end thereof to said torque tube so as to wrap about said torque tube as said torque tube is rotated in one angular direction about its own longitudinal axis, and to unwrap from about said torque tube as said torque tube is thereafter rotated in the opposite angular direction about its own longitudinal axis;

an eighth horizontally, transversally extending pivot joint means pivotally said second leg of said bell crank link distally of said crux to an opposite end of said series of pivotally interconnected links;

said bell crank link being so constructed and arranged as to have said first leg thereof project at least generally forwardly and said second leg thereof project at least generally downwardly when said landing gear are disposed in said raised condition thereof, and to have said fist leg thereof project at least generally vertically upwardly when said landing gear are disposed in said lowered condition thereof;

said series of pivotally interconnected links being con-

structed and arranged to rotatably pull said second leg of said bell crank link, by means of said eighth pivot joint means, from projecting at least generally vertically downwardly to projecting at least generally longitudinally forwardly as said torque tube is rotated in said one angular sense and to rotatably push said second leg of said bell crank link, by means of said eighth pivot joint means, from projecting at least generally longitudinally forwardly to projecting at least generally vertically downwardly as said torque tube is rotated in aid opposite angular sense.

4,601,514

SEAT HAVING AN ADJUSTABLE BACK SUPPORT ARRANGEMENT

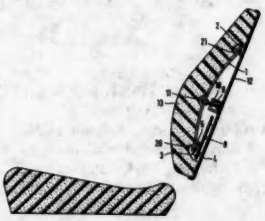
Hermann Meiller, Amberg, Fed. Rep. of Germany, assignor to Messrs. Willibald Grammer, Amberg, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,712

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324655

Int. Cl.[4] A47C *7/46*

U.S. Cl. 297—284 **12 Claims**



1. A seat including a backrest, said backrest including a backrest carrier structure, upholstery means mounted on said backrest carrier structure, and a vertebral support arrangement mounted on said backrest carrier structure and supporting said upholstery means, said vertebral support arrangement comprising:

a spring plate member curved forwardly with respect to the seat, said spring plate member bearing against the upholstery means to support said upholstery means forwardly, the spring plate member having a first edge portion defining an upper edge portion in relation to the backrest and a second edge portion defining a lower edge portion, and the spring plate member including a lower region and an upper region, said lower region having a lower resistance to bending than said upper region so that curvature initially increases in said lower region;

curving means located between said backrest carrier structure and said spring plate member and mounted on said spring plate member for varying the distance between the first edge portion and the second edge portions of the spring plate member to vary the curvature of said spring plate member; and

curvature restricting means located between said backrest carrier and said spring plate member for restricting an increase in the degree of curvature of the spring plate member in said lower region when said curving means decreases the distance between said first and second edge portions a predetermined distance, a further decrease in the distance between said first and second edge portions beyond said predetermined distance causes a maximum point of curvature of said spring plate member to jump from said lower region to said upper region, said upper region thereby becoming curved to shift an area of support for the back of an occupant of said seat in an upward direction.

4,601,515

SEAT FOR VEHICLES

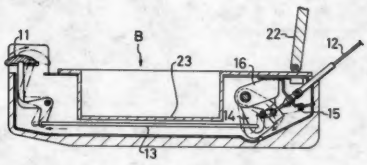
Susumu Hatsutta, and Takashi Yasui, both of Akishimashi, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,787

Claims priority, application Japan, Aug. 19, 1983, 58-129111[U]

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—361 **2 Claims**



1. In a seat for vehicles provided with an arm rest located substantially at a center position in the width-wise direction of the seat, a reclining device located at the rear side of the seat for inclining the seat and a remote control means arranged on said arm rest for remotely controlling said reclining device,

the improvement wherein said arm rest is pivotally, rotatably mounted on said seat and has a recessed portion formed at the upper portion thereof with a lid being pivotally, rotatably fixed thereto for covering said recessed portion, wherein an arm rest housing for containing said arm rest therein is formed in said seat at the position corresponding to said arm rest, wherein said remote control means are arranged at the forward end portion of said arm rest adjacent to said recessed portion, and wherein a linking mechanism for linking said remote control means to said reclining device is provided within said rest arm and comprises:

a rod member extending beneath the bottom of said recessed portion, said rod member being connected at one end thereof to said remote control means;

a substantially V-shaped arm member pivotally, rotatably fixed at the rearward portion of said arm rest, said arm having a first leg portion to which the other end of said rod member is connected and a second leg portion;

a spring means extended between said first leg portion of said arm member and the inner wall of said rest arm, said spring means being adapted to resiliently bias said first leg portion in a direction opposite to the operating direction of said remote control means; and,

an operation wire provided at the rear portion of said arm rest, said operation wire being of such an arrangement that one end thereof is connected to said second leg portion of said substantially V-shaped arm member while the other end thereof extends through the wall of said arm rest to connect with said reclining device.

4,601,516

CONTOURED CHAIR

Gerhart P. Klein, 45 Raymond St., Manchester, Mass. 01944

Filed Mar. 16, 1984, Ser. No. 590,443

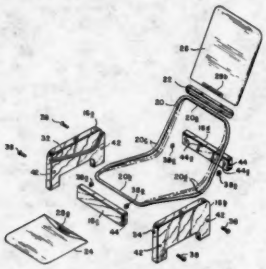
Int. Cl.[4] A47C *1/12*

U.S. Cl. 297—441 **10 Claims**

1. An article of furniture of the type including a seat composed of a closed frame and a flexible cover covering said frame, a pair of spaced-apart, upright support members having frame retaining means formed therein conforming to the contour of one or more side portions of said frame in edge profile and a pair of spacer members connected between said support members under the front and rear of the seat so that said seat is suspended from said support members, the improvement wherein

A. the sides of the frame are flexible and resilient and bowed away from one another with a natural spacing;

B. said seat includes means for prestressing said frame side members to a selected lesser spacing wherein they are in substantial parallelism as to stiffen the frame; and



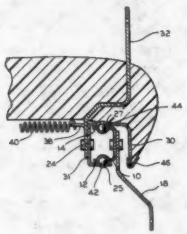
C. said retaining means engage said frame side portions at their said lesser spacing so that said frame side portions are supported securely by said support members when an ordinary person sits on the seat, yet exert substantially no lateral force on said support members.

4,601,517

INTEGRAL SEAT FRAME AND TRACK

Max O. Heesch, Ypsilanti, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Sep. 10, 1984, Ser. No. 649,191
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—452 **7 Claims**



1. A seat track assembly comprising:

a unitary seat frame formed from a single continuous, substantially box-shaped member including an upstanding base portion, a top leg extending from said base portion, a bottom leg extending from said base portion in spaced-apart parallel relationship with said top leg having a free edge, the length of said top leg being greater than the length of said bottom leg, a flange portion depending from said top leg in spaced-apart parallel relationship with said base portion having a free edge, said flange and said bottom leg free edge defining a space therebetween;

said continuous member formed to define a pair of spaced-apart parallel side rails and a front member between said side rails with said flange defining an outer peripherial surface of said seat frame;

each of said top and bottom legs of said seat frame including a longitudinal indentation extending along the length of each of said pair of side rails, said longitudinal indentation in said top leg and said bottom leg of each of said side rails opening toward each other;

two substantially channel-shaped base members each including an upstanding base section parallel to a respective one of said base portions of said seat frame side rails, an upper leg section extending from said base section and a lower leg section extending from said base section, each of said upper and lower leg sections of each of said two base members including a longitudinal indentation, each of said base members disposed a respective one of said side rails with said indentation in said upper leg sections and said indentation in said top leg opening toward each other, said indentation in said lower leg section and said indentation in said bottom leg opening toward each other, each said base section disposed spaced apart from each said base portion of said seat frame and disposed in close proximity to said space between said free edge of said bottom leg and said flange, each said channel-shaped base section opening toward said base portion of said seat frame;

a plurality of ball-type bearings disposed between said top leg and said upper leg and between said bottom leg and said lower leg within each said indentation therein;

bracket means extending through said space between said free edge of said bottom leg of said seat frame side rails, and said flange attached to each said base section of each said base member providing for attachment of said seat-track assembly to a mounting member; and

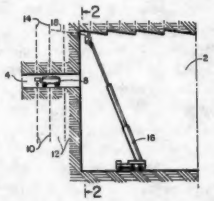
means extending from each said top leg of each said side rail portion for receiving at least one seat support member extending between said side rails.

4,601,518

METHOD OF EXCAVATING ROCK CAVERNS BY BLASTING

Per Lanéus, Vallingby, Sweden, assignor to JCC Johnson Construction Company AB, Stockholm, Sweden

Filed Mar. 21, 1984, Ser. No. 591,772
Claims priority, application Sweden, Mar. 23, 1983, 8301600
Int. Cl.[4] E21C 41/00
U.S. Cl. 299—13 **4 Claims**



1. A method of blasting an essentially elongated rock cavern tunnel, or shaft, preferably with a large cross-sectional area, comprising driving at least one drilling drift in the longitudinal direction of the cavern, drilling from said drilling drift first drill holes in successive planes extending transversely to the longitudinal axis of the intended cavern, charging and blasting in said first drill holes for excavating said cavern layer by layer,

said drilling comprising drilling said first drill holes in an essentially ring or fan-shaped pattern and partially outside the intended contour of said cavern, inserting rock strengthening means beyond said contour in said drill holes prior to blasting, whereby the cavern obtains such a degree of stability that work for reinforcing walls and roof subsequent to blasting can be carried out within the cavern, or that the cavern can be used for its intended purpose, for example for storing liquids, without any further reinforcement works following the removal of the blasted rock, and

drilling from a previously excavated part of said cavern, second drill holes along said contour of said cavern in its longitudinal direction to a depth approximately equal to the distance between every two of said successive transverse drilling planes, and using said second holes for pres-

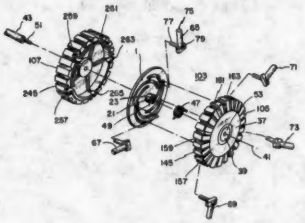
plitting the rock along said contour of said cavern before the round, or smooth blasting of the roof and walls of said cavern concurrent with or subsequent to the round.

4,601,519

WHEEL WITH EXTENDABLE TRACTION SPIKES AND TOY INCLUDING SAME

Bruce M. D'Andrade, 3 Ten Eyck Rd., Whitehouse Station, N.J. 08889

Filed Oct. 4, 1985, Ser. No. 784,252
Int. Cl.[4] B60B *15/12*
U.S. Cl. 301—45 **18 Claims**



1. A wheel, comprising:

(a) a hollow external wheel member having at least one structural rim wall, having a central hub on said rim wall about a central axis and attachable to an axle, having an outer peripheral travel surface of a predetermined radius from said central hub, and having a plurality of orifices located about said travel surface;

(b) a cam disc of a lesser radius than the predetermined radius of said peripheral travel surface of said external wheel member, said cam disc being movably located about the central hub of said external wheel member and within said peripheral travel surface of said external wheel member, said cam disc having a plurality of arcuated slider slots fanning out from said central hub and toward said peripheral travel surface;

(c) a plurality of spike pins being elongated and having a first end and a second end and having a length which is less than the predetermined radius of said peripheral travel surface of said external wheel member and having a cross section of shape and size small enough to pass through said orifices on said peripheral travel surface, said spike pins having a protrusion at said first end thereon and being slidably located within said arcuated slider slots of said cam disc, and the second end of said spike pins being located at least partially within the orifices of said peripheral travel surface; and

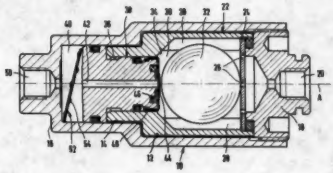
(d) bias means connected to said cam disc and to said external wheel member so as to hold said cam disc in a first position with said plurality of spike pins being entirely located within the radius of said peripheral travel surface by the predetermined positioning of said arcuated slider slots relative to the orifices of said peripheral travel surface and to hold said cam disc in said first position even while said wheel is being moved along a surface up to a predetermined torque, and connected so as to allow said cam disc to rotate about said central hub up to a second position with said spike pins at least partially extending and protruding through said orifices when said predetermined torque is attained, and connected so as to permit the return of said cam disc to said first position when the torque falls below said predetermined position.

4,601,520

PRESSURE REGULATING VALVE FOR AN HYDRAULIC VEHICLE BRAKING SYSTEM

Gerd Schmitt, Mayen, Fed. Rep. of Germany, assignor to Lucas Industries, Birmingham, England

Filed Oct. 13, 1983, Ser. No. 541,509
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1982, 3243053
Int. Cl.[4] B60T *13/00, 8/00*
U.S. Cl. 303—6 C **8 Claims**



1. A pressure regulating valve for an hydraulic vehicle braking system, comprising

a housing (10) which has a main cylinder connection (20) and an inlet chamber (30) connected therewith, as well as a wheel cylinder connection (50) and an outlet chamber (40) connected therewith,

a piston (38) which is arranged between the two chambers (30,40) and normally leaves open a connection between them, and

a valve member (32) which is adapted to be moved when a certain deceleration force acting upon it is exceeded into a closed position in which it interrupts the connection between the two chambers (30,40),

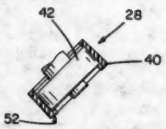
whereupon, when pressure in the inlet chamber (30) continues to increase, the piston (38) enlarges said inlet chamber (30) at the expense of the outlet chamber (40), wherein a throttle member (52) is arranged in the outlet chamber (40) and normally leaves open the wheel cylinder connection (50) but is adapted to be moved by the flowing brake fluid on sudden brake actuation into a position in which it partially covers the wheel cylinder connection (50).

4,601,521

ROLLING APPARATUS

Richard F. Foulke, Carlisle, Mass., assignor to Proconics International, Inc., Woburn, Mass.

Filed May 17, 1984, Ser. No. 611,418
Int. Cl.[4] F16C *29/04;* E05D *13/02*
U.S. Cl. 384—54 **15 Claims**



1. Rolling apparatus comprising

a support member,

first bearing means connected to said support member for rotating relative to said support member, said bearing means having a cylindrical surface over the entire outer diameter surface, and

a first tire of material softer than said bearing means mounted on said cylindrical outer diameter surface of said bearing means, said tire having a circumference that increases from a smaller diameter side to a larger diameter side, an opening on the smaller diameter side, an opening

on the larger diameter side, and a lip extending radially inward over a portion of said bearing means on the larger diameter side of said tire a sufficient amount to prevent said bearing means from passing through the opening on said larger diameter side, the opening on the smaller diameter side being larger than said opening on said larger diameter side and being sufficiently large so as to not prevent said bearing from passing through said opening on said smaller diameter side,

whereby said lip on said larger diameter side is biased against said bearing means as said tire travels, and said tire is prevented from moving off said bearing means at either side.

4,601,522

PULL-OUT GUIDE ASSEMBLY FOR DRAWERS OR THE LIKE

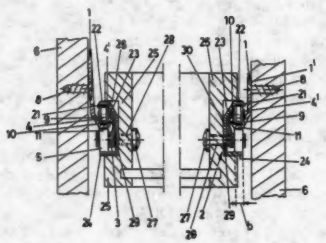
Erich Röck, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Apr. 17, 1984, Ser. No. 601,159

Claims priority, application Austria, May 3, 1983, 1614/83

Int. Cl.[4] A47B *88/14*

U.S. Cl. 384—19 **6 Claims**



1. In a drawer guide assembly for mounting a drawer for sliding movement into and out of a furniture body, said assembly being of the type including, for each of opposite sides of the drawer, a unit comprising a supporting rail attachable to a respective side of the furniture body, a pull-out rail attachable to a respective side wall of the drawer, and plural rollers positioned between and rollingly contacting respective surfaces of said supporting and pull-out rails, such that the weight of the drawer is transmitted from the pull-out rails to the supporting rails by means of said rollers, the improvement comprising:

a first said supporting rail being of a rigid construction such that it may be rigidly fixed to the respective side of the furniture body;

a second said supporting rail being of a flexible construction such that a portion thereof may be laterally movable from the respective side of the furniture body after attachment thereto;

said supporting and pull-out rails of each said unit having gripping portions for laterally retaining therebetween the respective said rollers; and

means for, after said supporting rails of said units have been attached to respective sides of the furniture body, joining said pull-out rails of said units to respective side walls of the drawer and for compensating for dimensional tolerances resulting from the spacing between said pull-out rails of said units being greater than the lateral dimension of the drawer, said joining means comprising first connecting means for connecting the respective drawer side wall to the first said pull-out rail adjacent said rigid first supporting rail and thereby for moving the drawer toward said first pull-out rail, said first connecting means comprising a first bolt extending through a hole in the respective drawer side wall and threaded into said first pull-out rail, said first bolt having a head abutting an inner surface of the respective drawer side wall, and second connecting means for connecting the respective drawer side wall to the second said pull-out rail adjacent said flexible second supporting rail and thereby for laterally moving said unit including said portion of said second supporting rail toward the respective drawer side wall, said second connecting means comprising a second bolt extending through a hole in the respective drawer side wall and threaded into said second pull-out rail, said second bolt having a head abutting an inner surface of the respective drawer side wall.

4,601,523

DRAWER FOR FURNITURE

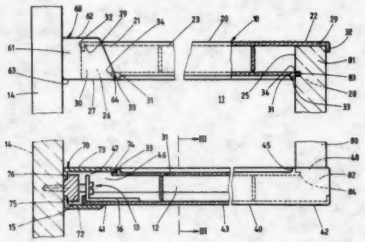
Erich Wenzlick, Durlangen, and Hermann Rothfuss, Waiblingen, both of Fed. Rep. of Germany, assignors to BBP-Kunststoffwerk Marbach Baier GmbH und Co. KG, Marbach, Fed. Rep. of Germany

Filed Apr. 30, 1984, Ser. No. 605,568

Claims priority, application Fed. Rep. of Germany, May 5, 1983, 8313250[U]

Int. Cl.[4] A47B *88/04*

U.S. Cl. 312—330 R **23 Claims**



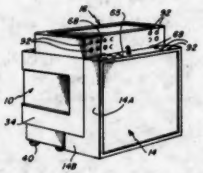
1. In a drawer for an article of furniture, comprising a bottom portion, two guide rails laterally engaged with said bottom portion; a front sheeting; a pair of fastening means for fastening said front sheeting to a respective guide rail; a pair of parallel side portions laterally covering said guide rails; a back portion; said side portions each having substantially a U-shaped cross-section and overlapping and engaging with a respective guide rail, said back portion extending transversally of said side portions; and a pair of caps each mounted to a respective side portion at a front end thereof and engaged therewith, said side portions each having a front end and a rear end and having at the rear end a first recess which accommodates an end portion of said back portion, the improvement comprising that said side portions are mirror-inverted relative to a central longitudinal axis of the drawer and each has the same shape so that the positions of one side portion and the other side portion in the drawer can be interchanged, each side portion including at the front end a second recess formed identically to said first recess, the second recess of each side portion accommodating each of said fastening means, said caps being releasably connected to said front sheeting and entirely enclosing said second recesses and the fastening means received therein, each of said side portions at the front and rear end thereof having the cross-section of a rectangular hollow profile, each hollow profile opening towards said bottom portion and also at one side thereof, each side portion further including an outer wall, an upper wall of the same length as said outer wall, and an inner wall parallel to said outer wall and of the length shorter than that of the outer wall, at least one of said outer wall and said inner wall having an arm extended normally to said wall and formed at a free end of said wall, said outer wall having two free ends and said inner wall having two free ends, said outer wall further including two arms at free ends thereof and said inner wall further including two arms at free ends thereof, the arms of the outer wall projecting in the same direction as the arms of said inner wall, the arms of said outer wall and the arms of said

inner wall of each side portion extending inwardly of the drawer, each arm of the outer wall defining with each arm of the inner wall in a direction of elongation of said side walls an opening, said outer wall and said upper wall of each side portion limiting said first and second recess at sides of the drawer and from above of the drawer, respectively.

4,601,524
DISPLAY DEVICE

Willy Ytter, Stockholm, Sweden, assignor to Extraversion, Inc., New York, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,514
Int. Cl.⁴ A47F *3/00*
U.S. Cl. 312—114 **9 Claims**



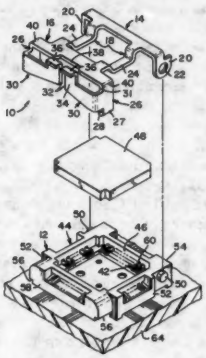
1. A display apparatus comprising;
a base housing having a front wall including a first display means,
an upper housing overlying the base housing and including a second display means,
means hingedly securing the upper housing to a rear end of a top surface of the base housing along a base hinge line,
said upper housing having a display position in which said second display means is directed forwardly and in which the upper housing is in an upright position, and a storage position in which at least part of the upper housing is disposed to extend over the top surface of the base housing,
said upper housing having top and bottom housing sections wherein the height of said bottom section is substantially equal to the distance between said base hinge line and said front wall of the base housing, wherein the top section is disposed over the bottom section in the display position and in the storage position the bottom section is disposed over the top surface of the base housing while the top section extends to cover the first display means,
means for hindgedly securing the upper housing top housing section to the upper housing bottom housing section along an upper hinge line,
said bottom and at least part of said top housing sections, in said display position, adapted to be disposed in substantially parallel co-planar vertical position,
wherein the upper hinge line in said storage position extends along the edge formed between the top surface and front surface of the base housing.

4,601,525
COVER FOR CHIP CARRIER SOCKETS

Steven J. Kandybowski, Tower City, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 20, 1985, Ser. No. 735,505
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—75 MP **9 Claims**

1. A cover for chip carrier sockets having downwardly facing shoulders on two opposing side walls, said cover comprising:
a. spaced apart front and rear rails connected by parallel and spaced apart side rails extending therebetween;
b. means on the rear rail for pivotally mounting the cover on the socket for movement between an open position and a closed position;
c. said front rail having the ends thereon bent downwardly to form depending sections and with the free ends of the depending sections bent inwardly to form lips, said lips being received under the downwardly facing shoulders when the cover is in a closed position on the socket; and
d. release means integral with the depending sections for withdrawing the lips from beneath the downwardly facing shoulders, said release means including lever arms

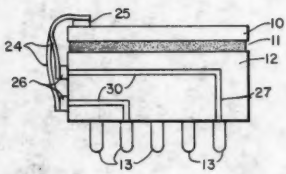


attached to each depending section and bent at right angles thereto so that with a downward force applied to the lever arms, the lips on the depending sections swing away from the downwardly facing shoulders on the socket on which the cover may be mounted.

4,601,526
INTEGRATED CIRCUIT CHIP CARRIER

William J. White, Chelmsford, Mass.; James M. Ortolf, Acton, and William R. Gordon, Burlington, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 546,256, Oct. 28, 1983, abandoned.
This application Aug. 28, 1985, Ser. No. 771,141
Int. Cl.⁴ H01R *9/09*; H01L *39/04*
U.S. Cl. 339—17 CF **14 Claims**



1. An integrated circuit chip carrier and electrical connector assembly apparatus comprising:
(A) a miniature electrical circuit for processing signals, said circuit having active components encompassed in a first area, said first area in the shape of a wafer having a bottom, top and sides;
(B) a plurality of first electrical contact pads located on said top of said circuit, said first electrical contact pads connected to different ones of said active components of said circuit;
(C) a first assembly substantially matched in size to said first area of said circuit, said first assembly having a top surface and a bottom surface which said surfaces are located within the boundaries of said first area, said first assembly also having side surfaces, said first assembly having good insulating properties;
(D) a plurality of second electrical contact pads located on at least one of said side surfaces of said first assembly;
(E) a second assembly having a top surface, said second assembly having good insulating properties;
(F) means for bonding said bottom of said wafer shaped first

area of said circuit to said top surface of said first assembly;

(G) a plurality of electrical leads attached between said first electrical contact pads and said second electrical contact pads, said electrical leads physically positioned from their points of attachment to said first pads above and overlying the top of said circuit down along at least one of said sides of said circuit;

(H) a first electrical input/output interconnector means comprising a pattern of electrical contacts, said first interconnector means attached on said bottom surface of said first assembly;

(I) a plurality of electrical circuit paths connected between said second electrical contact pads and said electrical contacts, said electrical circuit paths physically routed through said first assembly;

(J) a second electrical input/output interconnector means having a pattern of electrical contacts which have a mating capability to said contacts on said first interconnector means, said second interconnector means attached on said top surface of said second assembly; and

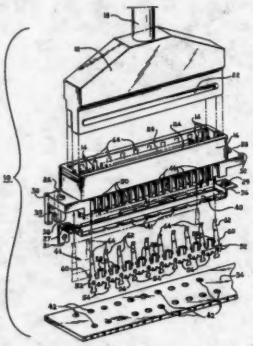
(K) means for enabling electrical connection between said first and said second electrical input/output interconnector means in a manner such that said first and second interconnector means are easily removable and reconnectable.

4,601,527

SHIELDED HEADER AND CABLE ASSEMBLY

Timothy A. Lemke, Carlisle, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 18, 1985, Ser. No. 692,957
Int. Cl.[4] H01R *4/66*
U.S. Cl. 339—14 R **11 Claims**



1. A shielded header for controlling high frequency electromagnetic signals comprising:

(a) a dielectric housing having a cavity open at its top, enclosed by front and rear elongated side walls and two end walls together with a floor perforated with a plurality of through holes each engaging an electrically conductive pin, a side skirt extending downward from each front and rear side wall, with a plurality of vertical grooves, each groove separated by a vertical rib in each side skirt;

(b) an elongated ground strip mounted between the side skirts, the ground strip having a plurality of notches aligned with a lower end of each vertical groove in the side skirt;

(c) an electrically conductive spring contact stamped from metal stock and formed to have alternating beams projecting upward in a common plane from a carrier strip with L-shaped ground bars between each beam, one leg of the ground bar attached to the carrier strip in a plane substantially the same as the beams and the other leg projecting at a right angle to the plane, a plurality of locking tabs attached to the carrier strip and projecting downward away from each beam, a plurality of shelf tabs attached to the carrier strip and projecting downward away from each ground bar and curled in a direction away from the ground bars;

(d) the spring contact mounted in the housing so that each beam is in contact with an interior side of the front and rear side wall, one leg of each ground bar projecting at right angles from the exterior of the side walls and the shelf tabs and locking tabs bent to grip opposite flat sides of the ground strip.

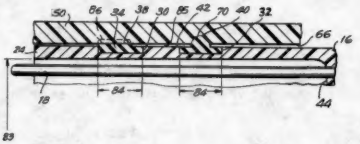
5. A shielded header according to claim 1 wherein each conductive pin is encircled by a filter element.

4,601,528

HERMETIC SELF-LOCKING ELECTRICAL CONNECTOR

I. Martin Spier, 50 Park Ave., New York, N.Y. 10016

Filed Aug. 20, 1985, Ser. No. 767,739
Int. Cl.[4] H01R *13/627*
U.S. Cl. 339—38 **22 Claims**



1. An electrical connector including a plug member and a receptacle member, said members being connected by motion toward each other and disconnected by motion in the opposite direction, the improvement therein comprising:

a first groove formed in a first rigid surface of a first one of said connector members, said groove extending transversely to said connecting and disconnecting directions;

a resilient first peripheral member protruding from a second rigid surface of the second one of said connector members and extending transversely to said connecting and disconnecting directions, said resilient first peripheral member being integrally formed on said rigid surface of second connector member, said first and second rigid surfaces having at least in part a telescopic relationship and at least part of the protruding portion of said resilient first peripheral member engaging said first groove of said first connector member when said plug and receptacle members are connected, pulling apart of said members being inhibited by said engagement of said first peripheral member in said first groove.

4,601,529

DEVICE FOR INTERCONNECTING OVERHEAD AND UNDERGROUND LOW-VOLTAGE ELECTRIC CABLES

Claude Billet, Fontenay sous Bois, France, assignor to Treficable Pirelli, Saint Maurice, France

Filed May 29, 1984, Ser. No. 614,873
Claims priority, application France, May 30, 1983, 83 09304
Int. Cl.[4] H01R *11/00*; 339 *60, 62, 63*
U.S. Cl. 339—60 M **12 Claims**

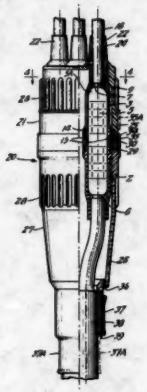
1. A device for interconnecting a plurality of insulated conductors of a multi-conductor, low voltage, overhead, electric cable with a plurality of insulated conductors of a multi-conductor, low voltage, underground, electric cable, said device comprising:

a plurality of conductive clamps mechanically and electrically connecting an end of each conductor of the overhead cable, respectively, to an end of the conductors of the underground cable, each clamp surrounding an end of a conductor of the overhead cable and an end of a conductor of the underground cable;

a plurality of separate, stretchable and elastic insulating, sleeves each made in two, separable and interengaging

parts and each insulating sleeve surrounding and engaging a conductive clamp, one for each clamp; and

a stretchable and elastic protective housing around and separable from said insulating sleeves, said protective housing being made of two separable and engaging parts,



each of the last mentioned said two parts having at least one opening therein for respectively receiving said overhead cable and said underground cable whereby said conductive clamps may be disposed in side-by-side relation within said protective housing.

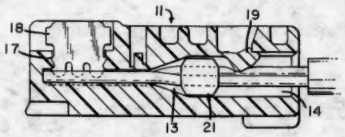
4,601,530
ELECTRICAL CONNECTOR AND WIRE ASSEMBLY METHOD

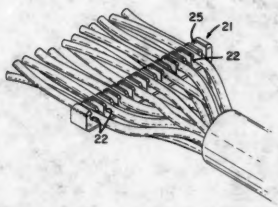
Daniel R. Coldren, Enola; Wayne S. Davis, Harrisburg, and Jon A. Fortuna, New Cumberland, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 645,946, Aug. 30, 1984, abandoned. This application Aug. 23, 1985, Ser. No. 769,992

Int. Cl.⁴ H01R *13/00*

U.S. Cl. 339—103 M **19 Claims**





1. A method of assembling discrete wires of a series of wires into preselected individual passageways of a series of passageways arranged in a connector housing in closely spaced relation in a single row, such passageways receiving the wires in a sliding fit and communicating through a divergent, wire guiding throat with a common wire receiving mouth of increased size, the method comprising the steps of:

loading discrete wires adjacent their free ends as a sliding fit in respective wire locating apertures of a series of apertures in a wire holder to form a subassembly, the wire holder being receivable as a sliding fit in the mouth and the apertures being at the same pitch as the passageways,

inserting the subassembly, wire holder first, into and along the mouth initially to bring the wire holder into abutment with the throat and subsequently to advance the free ends of the discrete wires to project out of the wire holder guided into respective passageways by the throat.

4,601,531
ELECTRICAL CONNECTOR FOR LARGE-CURRENT CIRCUITS

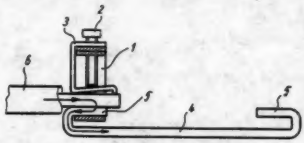
Hans W. Wider, Detmold, Fed. Rep. of Germany, assignor to C. A. Weidmueller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,295

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3408006

Int. Cl.⁴ H01R *4/36*

U.S. Cl. 339—272 R **5 Claims**



1. In an electrical connector for large-current circuits, comprising a longitudinally extending busbar having a pair of side edges extending between its ends; a clamping element of ferromagnetic material receiving a conductor to be connected to said busbar so that the electrical connector is a magnetically closed system; and a clamping organ, the improvement comprising said busbar having, at an end thereof to be connected to said conductor, a bend-over portion, bent to form a U-shaped part with one free end leg, said conductor having a free end laid immediately on the free end leg of said bend-over portion at a conductor plug-in side of the clamping member, said clamping member surrounding said free end leg of said bend-over portion including at least one of said side edges thereof with said free end of the conductor laid on said free end leg so that the clamping member abuts against said free end leg at a side thereof opposite to that on which said end of said conductor is laid, whereby current flowing through said conductor will emerge in said busbar exclusively at said plug-in side of said clamping element.

4,601,532
NARROW BAND LIGHT ABSORBING FILTER

Arlene K. Musser, St. Paul, and Peter M. Koelsch, Bloomington, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1983, Ser. No. 492,690

Int. Cl.⁴ F21V *9/06;* **G02B** *5/22, 5/28*

U.S. Cl. 350—1.1 **16 Claims**

1. An optical transmission filter absorbing radiation between 320 and 500 nm comprising a binder and at least one dye selected from the class of benzylidenes characterized by the fact that the binder comprises sufficient amount of phenol-formaldehyde resin to cause a shift in the spectral absorbance towards the red of said at least one dye.

4,601,533
LASER EYE PROTECTION VISOR USING MULTIPLE HOLOGRAMS

Gaylord E. Moss, Marina del Rey, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1982, Ser. No. 437,729

Int. Cl.⁴ G02B *5/32*

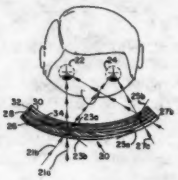
U.S. Cl. 350—3.7 **4 Claims**

1. A diffractive radiation shield for protecting a plurality of separated points displaced from one side of the shield from laser radiation of a desired wavelength incident on the other

side of the shield on lines from the radiation source through said points comprising:

a like plurality of coextensive transparent substrates to cover all of the points;

recording mediums respectively disposed on one side of said



substrates, each of said mediums having spherical holographic fringes of increasing radii which are centered about respective ones of the points and spaced according to the desired wavelength; and

optically transparent adhesive between said mediums forming a contiguous lamination thereof.

4,601,534

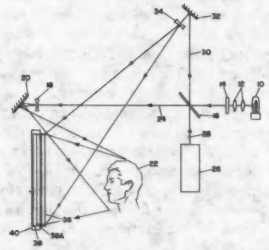
SHUTTERLESS PULSE LASER RECORDING SYSTEM AND METHOD

Peter Nicholson, 11-51 44th Dr., Long Island City, N.Y. 11101

Filed Jun. 27, 1983, Ser. No. 508,499

Int. Cl.[4] G03H *1/04*

U.S. Cl. 350—3.83 **23 Claims**



1. A shutterless holographic recording system for recording a holographic image of an object on a holographic recording medium, comprising:

a holographic image recording medium having a defined exposure sensitivity wavelength range and at least one exposure side facing an object whose image is to be recorded;

pulse laser means for generating an object and a reference beam along different respective paths toward the exposure side of the recording medium;

a high pass filter positioned on the exposure side of the image recording medium between the image recording medium and the object, said high pass filter having a cut-off wavelength below tbe upper limits of said exposure sensitivity wavelength range, to thereby transmit the object and reference beam light to the recording medium;

white light generation means for generating substantially white light having wavelength components below the cut-off wavelength of said high pass filter to illuminate the object, said white light generation means comprising a white light source for producing a white light illuminating beam which follows substantially the same optical path as the pulse laser object beam and emulates its directional and divergence characteristics, and a low pass filter positioned between the white light source and the object to be recorded whereby the object can be illuminated by substantially white light, and whereby the high pass filter blocks the wavelength components of the substantially white light below the cut-off wavelength of the high pass filter from reaching the image recording medium, but allows object and reference beam light having a wavelength above the high pass filter cut-off wavelength to expose the image recording medium.

4,601,535

OPTICAL COUPLING SYSTEM WITH INTERMEDIATE COUPLING MEDIUM

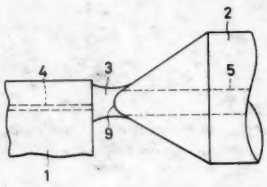
Toshiki Tanaka, Ome; Katsuyuki Imoto, Sayama, and Naoki Chinone, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,257

Claims priority, application Japan, Mar. 23, 1984, 59-54234

Int. Cl.[4] G02B *6/42*

U.S. Cl. 350—96.20 **4 Claims**



2. An optical coupling system between a semiconductor laser and an optical fiber characterized in that a medium having a refractive index greater than 1 but smaller than the refractive index of a semiconductor laser material is packed between the end surface of a distributed feedback type semiconductor laser and the end surface of said optical fiber, the refractive index of said medium packed between said semiconductor laser and said optical fiber changing continuously in the axial direction of optical coupling.

4,601,536

CONNECTION FOR A SUBMERGED OPTICAL FIBER CABLE

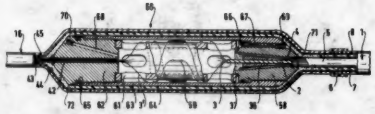
Lucien Guazzo, Calais, France, assignor to Les Cables de Lyon, Clichy, France

Filed Mar. 15, 1983, Ser. No. 475,561

Claims priority, application France, Mar. 17, 1982, 82 04505

Int. Cl.[4] G02B *6/36, 6/38, 6/44;* H02G *3/00*

U.S. Cl. 350—96.20 **7 Claims**



1. A connection for connecting a submerged optical fiber line cable to a housing for equipment such as a repeater, said housing being provided with an optical fiber access cable, and said line cable comprising an optical core containing optical fibers:

an arch of steel wires surrounding the core,

a copper tube swaged down over the arch, and

a protective insulating sheath fitted over the copper tube,

said connection comprising:

a hollow connection piece,

a end of said line cable being fixed to said connection piece by means of a conical ring interposed within the hollow

connection piece and between the arch of steel wires and said hollow connection piece,

a plug of hardenable resin surrounding said core and abutting the ends of said arch of steel wires and the end of said concial ring,

a storage magazine for storing excess lengths of said optical fibers,

said access cable being constituted by a tube inside which the optical fibers extend freely,

said tube extending from said housing to said storage magazine and being connected at one end to said repeater and at the other end to said storage magazine;

whereby, said connection is capable of withstanding high mechanical forces without suffering damage and being thoroughly watertight.

4,601,537

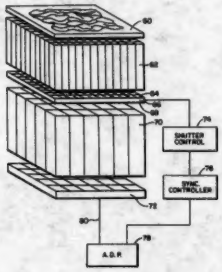
APPARATUS AND METHODS FOR FORMING IMAGES AND FOR OPTICAL DEMULTIPLEXING

Sean M. Saccocio, Columbus, Ohio, assignor to Ohio State University Research Foundation, Columbus, Ohio

Filed Jan. 6, 1984, Ser. No. 568,896

Int. Cl.⁴ G02B *6/08, 27/10;* **H04N** *5/225*

U.S. Cl. 350—96.27 **18 Claims**



1. An optical demultiplexer comprising:

(a) a light gate having an input first surface and an output second surface which are fixed relative to each other and subdivided into a two dimensional array of pixels, each of said pixels of said gate being switchable between a relatively translucent, light transmitting, on state and a relatively opaque light blocking, off state;

(b) means for projecting information bearing light onto the input, first surface of the light gate;

(c) a light detector having a two dimensional array of input pixel elements, each detector pixel element optically associated with and receiving light from a group of gate output pixels; and

(d) control means for controlling light transmission through the pixels of the light gate, said control means simultaneously turning on one pixel of each group and cycling in sequence through the pixels of each group.

10. An improved method for coupling an optical image to an optical image detector, the method being of the type wherein the image detector receives the image on a two dimensional array of detector pixel elements and wherein the improvement is a demultiplexing method which provides a pixel resolution substantially grater than the pixel resolution of the detector, said method comprising:

(a) projecting the image light onto the input first surface of a light gate having a two dimensional array of pixels which can be switched between on and off states to control the pixel light transmission to an output second surface of the light gate, the light gate having substantially more pixels than the detector;

(b) directing the light from each of a plurality of different groups of light gate pixels onto a different one of the detector pixel elements so that each detector pixel element receives light from all the light gate pixels of a different group; and

(c) simultaneously turning on one light gate pixel of each group and cycling in sequence through all the pixels of each group.

4,601,538

LIGHT REFLECTING SAFETY BELT

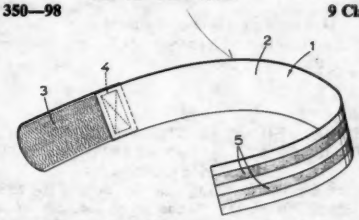
Arie Valkenburg, Bergweg 12, 3911 VB Rhenen, Netherlands

Filed May 18, 1984, Ser. No. 611,717

Claims priority, application Netherlands, May 27, 1983, 8301902

Int. Cl.⁴ G02B *5/128*

U.S. Cl. 350—98 **9 Claims**



1. A light-reflecting safety belt comprising:

a first fastening portion;

a second fastening portion fixedly connected to the first fastening portion at one end, wherein the first and second fastening portions form substantially the entire safety belt;

the safety belt having first and second sides, the operative face of the first fastening portion being on the first side of the belt, the operative face of the second fastening portion being on the second side of the belt; and

at least one light-reflecting strip-shaped portion on one side of the safety belt which extends over the entire length of the safety belt, but only over a part of the width of the safety belt, said light-reflecting portion positioned on the operative face of one of the fastening portions and on the inoperative face of the other fastening portion.

4,601,539

LENS MOVING DEVICE USING PIEZOELECTRIC MATERIAL

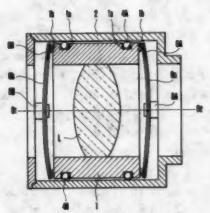
Yoshiaki Watanabe, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,720

Claims priority, application Japan, May 7, 1983, 58-79495; Feb. 13, 1984, 24614; Apr. 12, 1984, 59-74793

Int. Cl.⁴ G02B *7/04;* **H01L** *41/04*

U.S. Cl. 350—255 **6 Claims**



1. A lens moving apparatus comprising:

(a) a lens holder sleeve containing a movable lens;

(b) a body tube containing said lens holder sleeve;

(c) a member urging said lens holder sleeve to an initial position; and

(d) a lens drive member arranged on the opposite side of said lens holder sleeve to that on which said urging member lies, said lens drive member being made of piezoelectric material in a ring shape and being in contact with said lens holder sleeve so that when a voltage corresponding to the required amount of movement of said lens is applied to said lens drive member, said lens holder sleeve is moved against the biasing force of said urging member;

said lens driving member comprising an abutment portion in contact with said lens holder sleeve and a plurality of support arms helically extending from said abutment portion and made of piezoelectric material, one end of each of said support arms being in abutting engagement with or fixedly secured to said body tube, whereby when a voltage corresponding to a required amount of movement of said lens is applied to said drive member, said lens is driven to move axially by the piezoelectric action of said support arm.

4,601,540

METHOD AND APPARATUS FOR THE TURNING ON AND OFF OF A SIGNAL IN OPTICAL OR OPTRONIC DEVICES

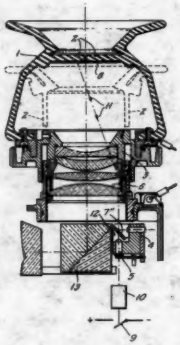
Heinrich Karning; Gerhard Raubinger, both of Heidelberg, and Wolfgang Weigel, Dossenheim, all of Fed. Rep. of Germany, assignors to Eltro GmbH, Heidelberg, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,178

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1982, 3225022

Int. Cl.[4] G02B *26/02, 26/08*

U.S. Cl. 350—266 **14 Claims**



1. An optical apparatus having a plurality of electrical elements, comprising:

(a) an eye piece housing;

(b) optics means for performing on optical function contained within said eye piece housing;

(c) an eye rest disposed on said eye piece housing, said eye piece housing and said eye rest defining a sight channel;

(d) normally closed shutter means coupled to said eye rest for blocking said sight channel, said shutter means and said eye rest configured to cause said shutter means to open in response to the application of pressure to said eye rest;

(e) reflex foil means provided on surfaces of said shutter means facing said eye piece housing;

(f) transmitter means for emitting a control signal along a transmission path;

(g) receiver means arranged on said transmission path, said path extending from said transmitter means to said reflex foil means to said receiver means, said shutter means being movable upon application of said pressure to said eye rest by the head of a user to open and uncover said sight channel to thereby interrupt the signal transmission path;

(h) energizing means for supplying energizing current to certain of said electrical elements of said optical apparatus retaining said apparatus in a READY operational state when said shutter means is closed; and

(i) switch means actuated by interruption of said signal transmission path by opening said shutter means for supplying energizing current to the other electrical elements of said apparatus and for putting said apparatus into an IN operational state.

4,601,541

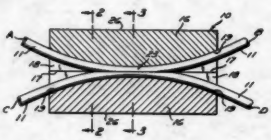
FIBER OPTIC DIRECTIONAL COUPLER

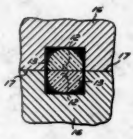
Herbert J. Shaw, Stanford; Ralph A. Bergh, Palo Alto, and George A. Kotler, Los Altos, all of Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Division of Ser. No. 139,511, Apr. 11, 1980, Pat. No. 4,493,528. This application Oct. 21, 1983, Ser. No. 544,079

Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—320 **2 Claims**





1. In a method of making a fiber optic directional coupler, the steps of:

providing two unitary blocks of rigid material with first and second parallel planar faces;

forming a slot across the first face of each of the blocks, each said slot having a greater depth towards the edges of the blocks than towards the center of the slot;

mounting a strand of single mode fiber optic material in each of the slots so that the strand extends along a path corresponding to the bottom wall of the slot, said fiber optic material having a core and a cladding;

removing material from each of the strands and the first faces of the blocks in a planar fashion to form a cutaway portion on each strand, said removing continuing until the cladding of each strand is within a few microns of the core in the center of the slot and no material is removed from the strand at the edges of the block;

determining the location of the core beneath the cladding at the cutaway portion during said removing step, said determining step comprising:

measuring the size of the cutaway portion of each strand; and

measuring the thickness of the blocks, between the first face and the second face to locate the core during the removal of the material from the blocks and strands, the step of measuring the size being performed prior to the step of measuring the thickness; and

placing the blocks together with the first faces in facing relationship and the cores of the strands in close proximity to each other where the cladding has been removed to form a region in which guided modes of the strands inter-

act through their evanescent fields to cause light to be transferred between the cores of the two strands.

4,601,542

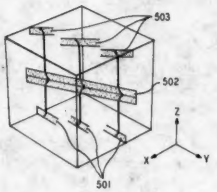
NEMATIC LIQUID CRYSTAL STORAGE DISPLAY DEVICE

Robert B. Meyer, Wellesley, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 434,618, Oct. 15, 1982, abandoned. This application Oct. 17, 1985, Ser. No. 788,107

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—334 **4 Claims**



1. A liquid crystal display cell capable of being switched to either a first state or a second state,

switching between said first state and said second state being in the absence of movement of a disclination in said display cell,

the cell comprising first and second substrates disposed in parallel relationship to each other, each substrate having a topographically textured inner surface exhibiting a uniform tilt at an acute surface tilt angle from a respective surface normal, and a nematic liquid crystal material having orientational directors disposed between both substrates, the cell comprising

means for generating a first polarity DC potential across the liquid crystal material to initiate a first change in orientational director configuration by breaking symmetry of the liquid crystal display cell in order to favor an orientational director configuration wherein an inversion layer of orientational directors is substantially adjacent and parallel to the first substrate, and

means connected to each substrate for generating an electric potential through the liquid crystal material to complete and maintain the first change in orientational director configuration so that the orientational directors are configured in the first state.

4,601,543

NEMATIC LIQUID CRYSTAL STORAGE DISPLAY DEVICE

Gary D. Boyd, Rumson; Julian Cheng, Little Silver, both of N.J.; Robert B. Meyer, Wellesley, Mass., and Robert N. Thurston, Colts Neck, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 434,524, Oct. 15, 1982, abandoned. This application Oct. 17, 1985, Ser. No. 788,108

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—334 **6 Claims**

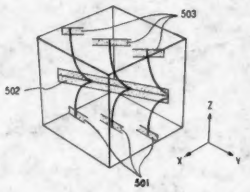
1. A liquid crystal display cell capable of being switched to either a first state or a second state,

switching between said first state and said second state being in the absence of movement of a disclination in said display cell,

the cell comprising first and second substrates disposed in parallel relationship to each other,

each substrate having a topographically textured inner surface exhibiting a uniform tilt at an acute surface tilt angle from a respective surface normal, and a nematic liquid crystal material having orientational directors disposed between both substrates,

the cell comprising means for initiating a first change in orientational director configuration by breaking symmetry of the liquid crystal display cell to favor the orientational director configuration wherein an inversion layer of



orientational directors is substantially adjacent and parallel to the first substrate, and

means connected to each substrate for generating an electric potential through the liquid crystal material to complete and maintain the first change in orientational director configuration so that the orientational directors are configured in the first state.

4,601,544

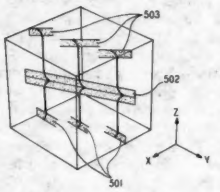
NEMATIC LIQUID CRYSTAL STORAGE DISPLAY DEVICE

Julian Cheng, Little Silver, and Robert N. Thurston, Colts Neck, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 434,522, Oct. 15, 1982, abandoned. This application Oct. 17, 1985, Ser. No. 788,673

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—334 **11 Claims**



1. A liquid crystal display cell capable of being switched to a first state under the influence of a first electric potential and to a second state under the influence of a second electric potential,

switching between said first state and said second state being in the absence of movement of a disclination in said display cell,

the cell comprising first and second substrates, and a nematic liquid crystal material having orientational directors disposed between both substrates,

the cell comprising means integrally connected to each substrate for preferentially attracting an inversion layer of orientational directors to be substantially adjacent and parallel to the first substrate so that the directors are aligned in the first state.

5. A liquid crystal display cell capable of being switched to a first state under the influence of a first electric potential and to a second state under the influence of a second electric potential,

switching between said first state and said second state being in the absence of movement of a disclination in said display cell,

the cell comprising first and second substrates, and a nematic

liquid crystal material having orientational directors disposed between both substrates,

the cell comprising first means integrally connected to each substrate for preferentially attracting an inversion layer of orientational directors to be substantially adjacent and parallel to the first substrate so that the directors are aligned in the first state, and

the cell comprising second means integrally connected to each substrate for preferentially attracting the inversion layer to be substantially adjacent and parallel to the second substrate so that the directors are aligned in the second state.

4,601,545

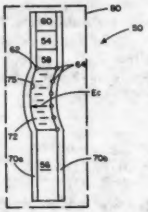
VARIABLE POWER LENS SYSTEM

Seymour P. Kern, 22 Timbergate, Irvine, Calif. 92714

Filed May 16, 1984, Ser. No. 610,686

Int. Cl.[4] G02F *1/13*; A61F *1/16*

U.S. Cl. 350—347 V **34 Claims**



1. A variable lens comprising:

a variable power optical device including an optically active lens responsive to an energy stimulus for changing the power of the lens;

control means for controlling the energy stimulus;

a source of energy for generating the energy stimulus for driving the control means and the lens;

a substrate for housing the lens, control means and energy source, each integrally deposited on the substrate.

33. A variable power Fresnel lens comprising:

a plurality of optically active lens elements arranged in a Fresnel lens pattern and responsive to a source of energy stimulus for changing the index of refraction over the lens surface, a source of energy stimulus and means for applying said energy stimulus to said lens elements in a controlled manner for selecting the optical power of said lens.

4,601,546

COLOR OPTICAL PRINTER HEAD HAVING LIQUID CRYSTAL LAYER

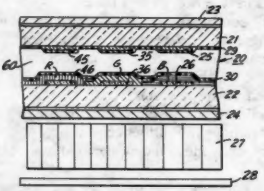
Takahiro Ohta, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 26, 1984, Ser. No. 573,943

Claims priority, application Japan, Jan. 28, 1983, 58-11406

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 F **3 Claims**



3. A color optical printer comprising: two glass substrates, plural liquid crystal shutter arrays between said two glass substrates, and arrays having transparent electrodes, the surface of transparent electrodes provided on one of said two glass substrates forming said liquid crystal arrays being covered with color filters on the side of the liquid crystal, said color filters being of different colors corresponding to each color to be resolved, and a light blocking layer between adjacent transparent electrodes covered with color filters of different colors on said one glass substrate for preventing at least white light from being transmitted therethrough, the whole surface covered with said color filters or said light blocking layer being covered with a protecting layer of photo-sensitive resin.

4,601,547

LIQUID CRYSTAL DISPLAY DEVICE HAVING CONTRAST-ENHANCING DYE

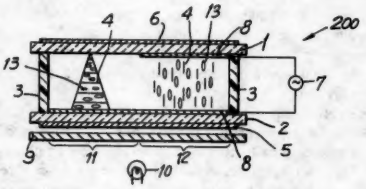
Hiroshi Shingu, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,544

Claims priority, application Japan, Apr. 26, 1982, 57-69868

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—349 **17 Claims**



1. A liquid crystal composition for use in a field effect negative display liquid crystal display element, comprising a nematic liquid crystal having positive dielectric anisotropy and an effective amount of a positive dichroic dye for eliminating leakage of incident light through non-selected portions of the display element.

9. A field effect liquid crystal display cell, comprising:

a first transparent substrate having transparent electrode means selectively deposited on one surface thereof;

a second transparent substrate having transparent electrode means selectively deposited on one surface thereof for cooperating with the electrode means on the first substrate for forming a display;

said substrates disposed with the electrode means facing each other and spaced apart for forming an interior space therebetween;

a liquid crystal material disposed in the space between the substrates;

each electrode means having disposed thereon orientation means having a direction of orientation;

a polarizer disposed on the surface of each substrate on the side opposed to the electrode means;

the liquid crystal material including a nematic liquid crystal having positive dielectric anisotropy and a dichroic dye admixed therein;

the molecules of the liquid crystal material lying substantially parallel to the direction of orientation of the substrates in the vicinity of the substrates with the molecules in the intermediate area between the substrates rotated at an angle to the direction of orientation; and

the axes of polarization of one of the polarizers coinciding with the direction of orientation of the liquid crystal molecules contacting that substrate for providing a negative display.

4,601,548

MICROLENS

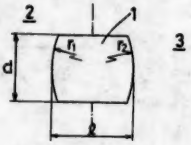
Mitsuru Nishikawa, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Oct. 28, 1983, Ser. No. 546,517

Claims priority, application Japan, Nov. 6, 1982, 57-168259; Jun. 28, 1983, 58-100415

Int. Cl.[4] G02B *3/00*

U.S. Cl. 350—416 2 Claims



1. A microlens for forming in the air the image of an object present in the air, said microlens comprising a single lens having a diameter of not more than 0.58 mm and made of a material having a refractive index of 1.75 to 1.85 both inclusive, said microlens meeting the following conditions:

$0.58 \leqq r_1 \leqq 0.60$ (mm)

$0.42 \leqq r_2 \leqq 0.44$ (mm)

$0.45 \leqq l \leqq 0.55$ (mm)

wherein r_1 is the radius of curvature of one of the opposite surfaces of said microlens facing the object, r_2 being the radius of curvature of the other of its opposite surfaces on the side where an image is formed, and l being the axial length of said microlens.

4,601,549

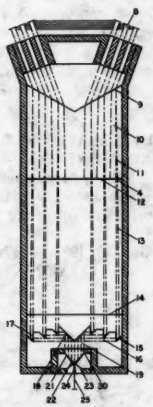
ULTRAVIOLET BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Nov. 15, 1984, Ser. No. 671,716

Int. Cl.[4] G02B *13/18, 17/08*

U.S. Cl. 350—432 1 Claim



1. An ultraviolet beam concentrator 2RT-LTLT-TR:CUV comprising;

a. An upper component lens TR (1) with a concave conical section (9) and a planar section (12),

b. Three annular conical louvers (2) mounted above upper component lens TR (1),

c. A circular shield (3) having three annular slits (4) mounted below upper component lens TR (1),

d. A middle component mirror (5) having a planar section (14), three annular rear-surface 45° mirrors (15), three cylindrical sections (17) and a convex conical front-surface 45° mirror (18), and

e. A lower beam concentrator M:2RT:C (6) mounted below middle component mirror (5) and having a planar section (20), a convex conical section (21), a convex conical section (23) and a concave conical section (24).

4,601,550

STEREO-MICROSCOPE WITH A COMMON OBJECTIVE LENS SYSTEM

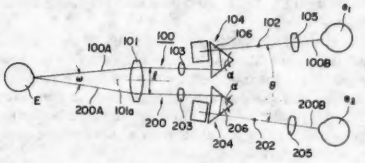
Hisakazu Yoshino; Shinichi Nishimura, and Kazutoshi Takagi, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 637,503

Claims priority, application Japan, Aug. 8, 1983, 58-143685; Aug. 8, 1983, 58-143686

Int. Cl.[4] G02B *21/22*

U.S. Cl. 350—516 12 Claims



1. In a stereo-microscope comprising a common objective lens system with a stereo angle ω defined as the angle between an incident optical axis of a first optical path and an incident optical axis of a second optical path toward an object; a first and second imaging lens systems having optical axes parallel to that of the objective lens system and producing intermediate images of said object to be observed; a first and second optical path deflecting means arranged behind said respective imaging lens systems for deflecting the respective ejection bundle of rays outwardly with respect to the optical axis of said objective lens system; and a first and second ocular systems arranged behind said respective optical path deflecting means for observing the respective intermediate images, characterized in that said stereo angle ω and an observation angle θ which is defined as the angle between the observation optical axes of said first and second ocular systems are equal.

4,601,551

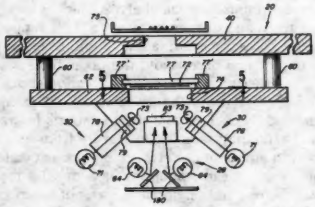
MANIPULATION OF EMBRYOS AND OVA

James T. Pettingell, Escondido, and T. Charles Podvin, Poway, both of Calif., assignors to The Micromanipulator Microscope Company, Inc., Escondido, Calif.

Filed Jan. 23, 1984, Ser. No. 573,054

Int. Cl.[4] G02B *21/06*

U.S. Cl. 350—525 17 Claims



11. A work station for performing micromanipulations on an embryo or an ovum extracted from an animal comprising

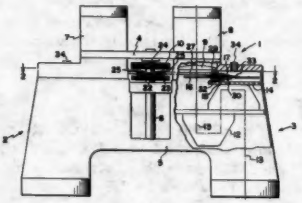
a microscope having an objective,
a stage disposed below said objective for placement of an ovum- or embryo-containing specimen thereon, said stage having an aperture aligned with said objective,
means for adjusting the width of said aperture to adjust the depth-of-field of the microscopic image of the specimen,
bright-field illuminator means disposed below said stage for emitting light directed upward through said aperture, through the ovum- or embryo-containing specimen positioned on said stage and into said objective,
first means for adjusting the intensity of light emitted by said bright-field illuminator means,
dark-field illuminator means disposed below said stage for emitting light directed through said aperture and through the specimen at an oblique angle at which said dark-field illuminator means-directed light does not enter said objective, while contrasting dark-field illuminator means-emitted light that is scattered by said specimen enters said objective,
colored filter means associated with said dark-field illuminator means for coloring the light emitted thereby to contrast it with the light emitted by said bright-field illuminator means,
second means for adjusting the intensity of light emitted by said dark-field illuminator means, said first and second means for adjusting being independently and simultaneously operable to provide illumination that is bright-field, dark-field, or a composite including an adjustable component of bright-field and an adjustable component of contrasting dark-field,
tool means for manipulating on the embryo or ovum in said specimen, and
micromanipulator means for moving said tool means relative to the embryo or ovum.

4,601,552

BINOCULAR CONSTRUCTION HAVING ADJUSTABLE FILTERS

Floyd E. Jessmore, 1741 Sullivan St., Saginaw, Mich. 48603

Filed Oct. 22, 1984, Ser. No. 663,323
Int. Cl.[4] G02B *5/20, 5/30, 23/00*
U.S. Cl. 350—551 **11 Claims**



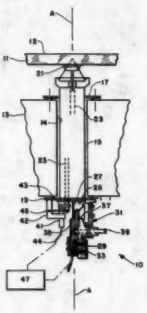
1. A binocular construction comprising a pair of barrels within each of which are lenses and a prism defining a light path; means mounting said barrels side by side for relative rotation about an axis therebetween; a filter support for each of said barrels; means mounting one of said filter supports wholly within one of said barrels and the other filter support wholly within the other of said barrels for rotation about parallel axes of rotation offset from the associated light path; at least one filter carried by each of said filter supports for rotation therewith and extending radially outwardly from its axis a distance sufficient to intercept light traversing the associated light path; driving means; means mounting said driving means between said barrels for rotation about the axis of rotation of said barrels; and drive transmitting means extending from said driving means into said barrels and coupling said driving means to each of said filter supports for rotating said filter supports conjointly about their axes.

4,601,553

FINE FIGURING ACTUATOR

John W. Pepi, Maynard, and Christopher M. Finch, Lowell, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 17, 1984, Ser. No. 661,833
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—611 **4 Claims**



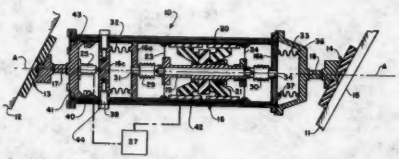
1. An actuator for controlling the shape of a faceplate supporting a mirrored surface, comprising:
a. a substantially rigid support;
b. a movable control member for contacting said faceplate;
c. an electrically controlled magnet and coil assembly operatively interconnecting said rigid support and said control member and responsive to an input signal to said magnet and coil assembly, one of said magnet and coil operatively attached to said rigid support and the other operatively attached to said control member for controllably moving said member against said faceplate whereby the shape of said faceplate is controllably altered near the point of contact of said control member with said faceplate; and
d. a position transducer operatively interconnecting said control member and said support, for sensing the position of said control member relative to said support and providing a corresponding output signal.

4,601,554

VIBRATION ISOLATOR ACTUATOR FOR A SEGMENTED MIRROR

Roland L. Plante, Hudson, Mass., and Austin L. McKenney, Amherst, N.H., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 10, 1985, Ser. No. 690,438
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—611 **12 Claims**



1. An actuator for controlling the position of a mirror segment of a segmented mirror assembly, and for isolating said mirror segment from vibration, comprising:
a. a substantially rigid support;
b. a movable control member for operative interconnection of said rigid support and said mirror segment;

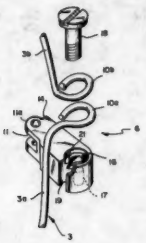
c. moving means, responsive to an input signal thereto and operatively connected to said control member, for controllably moving said control member whereby said segment may be selectively positioned relative to said rigid support in response to movement of said control member;
d. first force amplification means connected to a first end of said control member for amplifying the force exerted on said control member by said moving means; and
e. position sensing means including a position transducer, operatively connected to said control member, for sensing the position of said control member relative to said rigid support and providing a corresponding output signal.

4,601,555

METAL FRAME FOR EYEGLASSES

Vittorio Tabacchi, and Vincenzo Viel, both of VII Strada, n.20, Padova, Z.I., Italy

Filed Aug. 20, 1984, Ser. No. 642,174
Int. Cl.[4] G02C *1/08*
U.S. Cl. 351—90 9 Claims



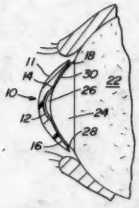
1. A metal frame for eyeglasses comprising a front frame having a pair of lens-bearing rims, a pair of temple pieces and means for hingedly connecting each temple piece to a corresponding rim, the means including a nose characterized in that it is a monolithic block of substantially prismatic shape and predominantly longitudinal development, a pair of branches formed in each rim for connecting an end of the nose to the rim, one branch being fixedly connected to the nose and the other being demountably connected to it, a seat formed in the other end of the nose, an end of the temple piece being received in the seat and means for hingedly connecting the nose to the seated end of the temple piece.

4,601,556

CORNEAL CONTACT LENS FOR THE EYE OF A PATIENT WITH KERATOCONUS DISEASE AND METHOD OF MAKING THE SAME

Nick C. Siviglia, 700 Eden Rd., Lancaster, Pa. 17601

Filed Oct. 26, 1983, Ser. No. 545,730
Int. Cl.[4] G02C *7/04*
U.S. Cl. 351—160 R 6 Claims



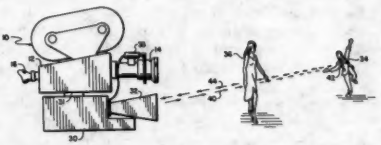
1. A corneal contact lens for the eye of a patient with a keratoconus diseased cornea, the lens having a posterior surface comprised of:
a first generally circular vaulting zone having a diameter slightly greater than the diameter of the diseased area of the cornea and having a radius of outward curvature generally corresponding to but slightly greater than the outward protrusion of the diseased area, the first zone being generally centered upon, generally parallel to and spaced from the diseased area of the cornea;
a second generally annular transition zone extending radially beyond the first zone, the second zone having a radius of curvature flatter than that of the first zone; and
a third generally annular bearing zone extending radially beyond the second zone, the third zone having a radius of curvature flatter than that of the second zone.

4,601,557

MOTION PICTURE CAMERA AUTOMATIC FOCUSING SYSTEM

Robert W. Bogle, 991 Skylark Dr., La Jolla, Calif. 92037; Gary Gero, 25191 Rivendell Dr., El Toro, Calif. 92630, and Stephen L. Wald, 6509 Dennison St., San Diego, Calif. 92122

Continuation-in-part of Ser. No. 510,686, Jul. 5, 1983, Pat. No. 4,534,629. This application Aug. 8, 1985, Ser. No. 763,949
Int. Cl.[4] G03B *3/00*
U.S. Cl. 352—140 16 Claims



1. A method of automatically focusing a camera, said method comprising the steps of
(a) generating a first radio signal and transmitting the first radio signal from the camera to be focused toward a photographic subject;
(b) responding to said first radio signal by generating a second radio signal and transmitting the second radio signal from the photographic subject;
(c) receiving the second radio signal at the camera;
(d) measuring the time interval between the transmittal of the first radio signal and the receipt of the second radio signal and generating a range signal that is representative of said measurement; and
(e) adjusting the focus of the camera in response to the range signal.

4,601,558

AUTOLOADING MICROFICHE READER

Wilfried Hofmann, Taufkirchen; Andreas Holzmann, Bruckberg; Adolf Koopmann, Munich; Ruth Meggendorfer, Unterhaching, and Jürgen Sylla, Sauerlach-Arget, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

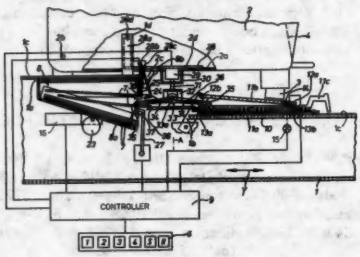
Filed Feb. 19, 1985, Ser. No. 702,877
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407707
Int. Cl.[4] G03B *23/08*
U.S. Cl. 353—27 R 9 Claims

1. An apparatus for viewing microfiches held in a cassette, the apparatus comprising:
a housing defining a rear seat for the cassette holding the microfiches and having a front viewing area;
optical means on the housing for viewing a microfiche in the area;
a holder constructed to carry one of the microfiches dis-

placeable on the housing in the area with respect to the optical means for presenting selected portions of a microfiche carried by the holder to the optical means;

selector means in the housing for separating a selected microfiche in the cassette from the other microfiches in the cassette;

a drive support rotatable about and displaceable along an upright axis between the viewing area and the cassette-holding seat and having a pair of generally diametrally opposite arms having outer ends provided with respective drive rollers, the support being rotatable about its axis



between a transport position with one roller engaged in the area and the other roller in the cassette in the seat and with the arms extending in a transport direction between the area and seat, and an out-of-service position extending transverse to the direction with neither roller in the area or in the seat; and

motor means for rotating the rollers when the support is in the transport position in one rotational sense to displace a microfiche in the transport direction from the cassette in the seat to the holder in the area and in the opposite rotational sense to displace a microfiche from the holder in the area to the cassette in the seat.

4,601,559

SLIDE PROJECTOR AND SLIDE TRAY

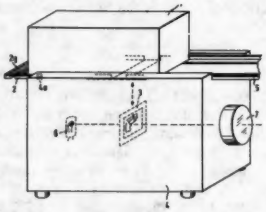
Eckhart Oehmichen, Hoelzleswiesen 18, Stuttgart 75, and Alf K. Neustadt, Mohlstrasse 4, Stuttgart 1, both of Fed. Rep. of Germany

Filed Jan. 24, 1984, Ser. No. 573,388

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1983, 3302181; Jan. 24, 1983, 3302182

Int. Cl.[4] G03B *23/02*

U.S. Cl. 353—111 **14 Claims**



1. A slide projector adapted for receiving linearly extending slide trays, each said tray having a cover portion and a housing portion divided into compartments operating on the gravity feed principle, including: a drive for said tray housing portion; a top portion having a first receptacle for the cover portion of said tray having a toe dog, a locking means, and an unlatching part forming an operative connection for unlatching the housing of said tray during insertion of the tray, said first receptacle being provided, at one end thereof, with a vertical passageway and, behind said passageway and in alignment with said cover portion of said tray when inserted therein a cover element integral with the housing of the projector; and each of said receptacles containing a switching means which releases the drive for the housing portion of tray only if both covers have locked into operating position.

4,601,560

FOCUS ADJUSTMENT IN AN ALIGNMENT AND EXPOSURE APPARATUS

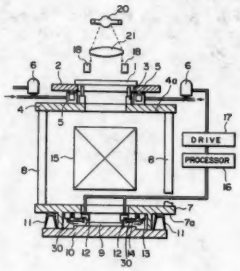
Junji Isohata, Tokyo, and Tamotsu Karasawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 630,107

Claims priority, application Japan, Jul. 18, 1983, 58-129391

Int. Cl.[4] G03B *27/34*

U.S. Cl. 353—122 **38 Claims**



1. An alignment and exposure apparatus for use with a mask and a wafer, comprising:

means for holding the mask;

means for holding the wafer;

projection exposure means, having an imaging characteristic, for projecting the image of the mask onto the wafer for exposure thereof;

non-contact measuring means for measuring the distance from a reference position to the wafer without contacting the wafer;

means for determining a mask position adjusting value on the basis of the measured distance measured by said measuring means and the imaging characteristic of said projection exposure means, and for producing an adjusting signal representative thereof;

means responsive to the adjusting signal produced by said adjusting value determining means for adjusting the position of the mask in accordance with the adjusting value determined by said adjusting value determining means; and

observation means for obtaining alignment between the mask and the wafer, said observation means being moved in the direction of the optical axis of said projection exposure means in response to said adjustment of the position of the mask by said adjusting means.

4,601,561

AUTOMATIC HOUSING TYPE ELECTRONIC FLASHLIGHT DEVICE OF A FOLDING TYPE CAMERA

Yoshimi Yamashita, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 655,027

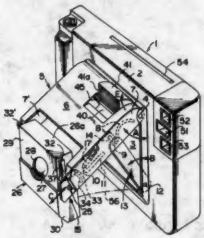
Claims priority, application Japan, Oct. 30, 1983, 58-151516[U]

Int. Cl.[4] G03B *15/05, 17/04*

U.S. Cl. 354—149.11 **6 Claims**

1. An automatic housing type electronic flashlight device of a following type camera including:

(i) a front cover having a base end portion and being supported near said base end portion on a swing shaft parallel with a film supporting face of a camera body for swinging between a position where said front cover closes an opening of a front face of the camera body and a photograph taking position where said front cover opens said opening,
(ii) slide members supported for sliding along said front cover in the direction approximately normal to said swing shaft,
(iii) a shutter board provided with a photograph taking lens and supported at front end portions of said slide members for rotation around a rotation shaft parallel with said swing shaft, and
(iv) rotatable levers each having one end portion supported on the camera body for rotation around a rotation shaft parallel with said swing shaft, and engaged near the other end portion with said front cover and each of said slide members so that, when said front cover is swung toward said photograph taking position, said rotatable levers are rotated in engagement with said front cover to make said slide members slide from the base end side of said front cover to a front end side thereof,



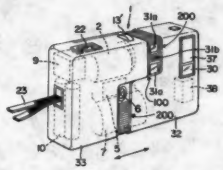
the automatic housing type electronic flashlight device comprising:
(a) an electronic flashlight tube positioned in a cutaway portion near said base end portion of said front cover and supported for rotation around a rotation shaft parallel with said swing shaft of said front cover so that said electronic flashlight tube is rotated between an operating position where a light emission face of said electronic flashlight tube extends away from said cutaway portion outwardly of said front cover so as to face front and a housed position where said light emission face is housed inside of said front cover,
(b) an urging means for urging said electronic flashlight tube toward said operating position,
(c) a pin projecting laterally from said electronic flashlight tube, and
(d) a cam plate secured to said slide members for pushing said pin against urging force of said urging means and rotating said electronic flashlight tube to said housed position when said slide members are slid from the front end side of said front cover to the base end side thereof.

4,601,562
CAMERA

Saburo Yoneyama, Musashino; Masami Fujita, Machida; Shizuo Ishii, Tokyo; Mutsuhito Kichima, Asaka; Yoshiharu Takahashi, and Yoshinobu Sameshima, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,013
Claims priority, application Japan, Dec. 10, 1983, 58-190672[U]; Dec. 10, 1983, 58-190673[U]; Dec. 10, 1983, 58-190674[U]
Int. Cl.⁴ G03B *1/12, 17/02*
U.S. Cl. 354—170 **16 Claims**

1. A camera comprising: an exposure frame having a rectangular shape; a film advancing unit including a film take-up chamber and a patrone chamber juxtaposed to each other adjacent to the respective longer sides of said exposure frame; and a taking lens disposed in front of said exposure frame, wherein the improvement resides in that, as viewed from the back of a camera body which is placed such that said exposure frame is long sideways:
(a) said camera has a nearly rectangular and long sideways shape of body;

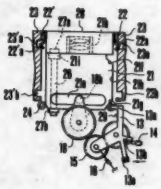


(b) a first camera parts accommodating chamber is disposed at the righthand side of said film advancing unit whereas a second camera parts accommodating chamber is disposed at the lefthand side of the same; and
(c) a rear cover is arranged such that its lefthand edge is positioned at the boundary between said film advancing unit and said second camera parts accommodating chamber.

4,601,563
MOTOR DRIVEN FOCAL LENGTH CHANGING DEVICE FOR A CAMERA

Makoto Miyawaki, Kanagawa; Michio Hirohata, Tokyo; Yukio Ogawa, Kanagawa, and Takanori Kodaira, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,685
Claims priority, application Japan, Nov. 2, 1983, 58-204940
Int. Cl.⁴ G03B *3/00*
U.S. Cl. 354—195.1 **4 Claims**



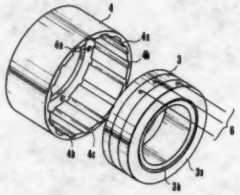
1. A motor driven focal length changing device for a camera comprising:
(a) a first transmission system for transporting a film;
(b) a second transmission system for moving a lens to change the focal length;
(c) a drive system;
(d) a clutch for transferring the driving power of said drive system to either one of said first and said second transmission systems, said clutch making said first transmission system operative during ordinary operation;
(e) actuating means for changing over said clutch so as to transmit the driving power of said drive system to said second transmission system, said means being operated manually; and
(f) a switch for causing said drive system to move, said switch being rendered to an active switched condition in response to manual operation of said actuating means, whereby said drive system is energized.

4,601,564

LENS BARREL HAVING MOTOR

Hiroshi Yamamoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,381
Claims priority, application Japan, Jun. 5, 1984, 59-082562[U]
Int. Cl.[4] G03B 9/02
U.S. Cl. 354—271.1 3 Claims



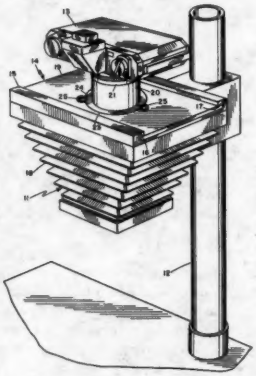
3. A lens barrel comprising:
(a) a stationary cylinder constituting part of said lens barrel;
(b) a diaphragm device;
(c) a stepping motor for driving said diaphragm device,
said stepping motor comprising a stator and a rotor which are formed to a hollow core cylindrical shape with an aperture opened so as to pass an image bearing beam at the centeral portion of said rotor; and
(d) a vibration-proof member for preventing vibrations of said motor,
said vibration-proof member being made of a vibration absorbable material, being formed to a cylindrical shape,
when said motor is fixedly mounted in the inner diameter of said stationary cylinder being positioned between said stator and said stationary cylinder so as to wrap the outer periphery of said stator, and further
said cylindrical vibration-proof member having grooves for accommodation of the lead wires of said motor.

4,601,565

CAMERA ADAPTER DEVICE

Harrold Fisher, La Mesa, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Dec. 18, 1984, Ser. No. 683,249
Int. Cl.[4] G03B 17/00
U.S. Cl. 354—293 5 Claims



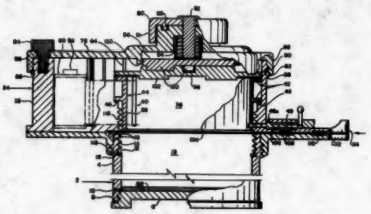
1. An adapter device for use with a copy camera of the type having an open back and guide means for mounting a film holder over the camera back, the device comprising:
a plate for securing to the back of the copy camera in place of the film holder, the plate being shaped and dimensioned to make with the film holder guide means and cover the open back of the camera and having an opening for alignment with the copy camera lenses;
adapter means rotatably mounted on the plate in alignment with the opening, the adapter means including projecting connector means for releasably securing a 35 mm camera to the plate in alignment with the plate opening; and
releasable securing means for releasably securing the adapter means and connected 35 mm camera in any chosen rotated position relative to the copy camera.

4,601,566

DAYLIGHT MULTI-REEL FILM LOADER AND DEVELOPING TANK

Luis Bernhard, 926 Wilson Dr., New Orleans, La. 70119

Filed Aug. 10, 1984, Ser. No. 639,590
Int. Cl.[4] G03D 13/06
U.S. Cl. 354—311 7 Claims



1. An apparatus for daylight loading and developing of at least one roll of photographic film, of the type supplied in a cassette, comprising:
a. a substantially light-tight tank having a vertical chamber therein;
b. a removable, light baffle means, dividing said vertical chamber, into an upper and a lower chamber;
c. a reel loading means in said upper chamber, adapted to receive and load exposed photographic film from a cassette to a reel;
d. wherein said light baffle means is further adapted to move to a first position closing off said lower chamber from introduction of light when said upper chamber is open to receive a reel and a cassette, and is adapted to move to a second position adapted to permit free movement of said reel from said upper chamber to said lower chamber.

4,601,567

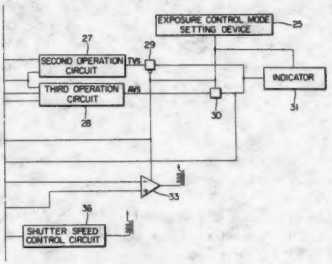
EXPOSURE CONTROL APPARATUS FOR CAMERA

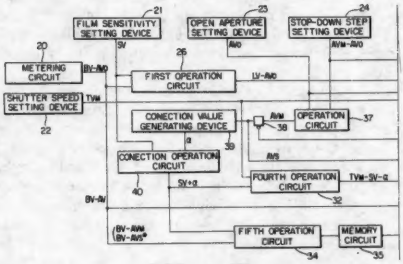
Takashi Saegusa, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,344
Claims priority, application Japan, Sep. 20, 1983, 58-173663
Int. Cl.[4] G03B 7/08
U.S. Cl. 354—443 14 Claims

1. A camera having stop-down means for stopping down a stop of a photographic lens and means for exposing a film in accordance with a preset shutter speed to provide an optimal exposure, comprising:
(a) a metering optical system arranged behind said photographic lens with respect to an object;
(b) means for generating a light intensity signal representing a light intensity from the object through said metering optical system and said photographic lens;
(c) calculating means for calculating an aperture value to provide an optimal exposure in accordance with the light intensity signal and the preset shutter speed and for producing an aperture signal indicative of said calculated aperture value;

(d) means for detecting that the aperture value represented by said aperture signal falls within a predetermined range and for generating a detection signal; and





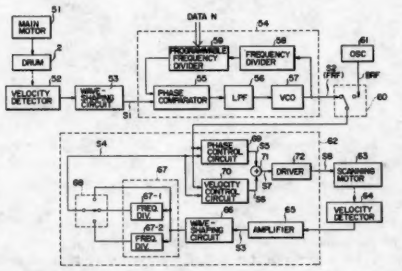
(e) control means for controlling said stop-down means, the control means controlling said stop-down means so that the control means has an aperture value different from said aperture value represented by said aperture signal, in accordance with said detection signal.

4,601,568

DOCUMENT-SCANNING CONTROL APPARATUS FOR IMAGE-FORMING APPARATUS

Shoji Takano, Kawasaki, and Fumito Ide, Zama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 24, 1984, Ser. No. 664,294
Claims priority, application Japan, Oct. 26, 1983, 58-200207
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—8 **8 Claims**



1. A document-scanning control apparatus for an image-forming apparatus, comprising:

scanning means for moving relative to a document and for scanning and optically reading the document;

a photosensitive body which is moved upon a relative movement between the document and said scanning means and on which an image of the document obtained by said scanning means is formed; and

control means for synchronizing a scanning velocity of said scanning means with movement of said photosensitive body, the control means including:

first velocity detecting means for detecting a moving velocity of said photosensitive body and for generating a signal of a frequency corresponding to the detected moving velocity;

frequency converting means for converting a frequency of an output signal from said first velocity detecting means into a high frequency corresponding to a magnification of a formed image;

second velocity detecting means for detecting the scanning velocity of said scanning means and for generating a signal of a frequency corresponding to the detected scanning velocity; and

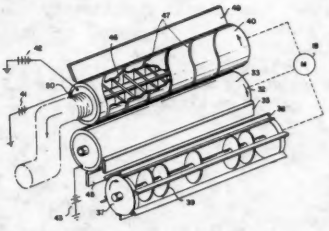
motor controller for controlling the scanning velocity of said scanning means so that the frequency of an output signal from said second velocity detecting means is proportional to that of an output signal from said frequency converting means.

4,601,569

APPARATUS FOR CLEANING A PHOTOCONDUCTOR

Vladimir A. Garris, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,734
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 **13 Claims**



1. In a cleaning apparatus for removing residual toner particles from a surface of a photoconductor, the apparatus including magnetic brush means including magnetic particles forming a nap for capturing toner particles from the surface; detoning means including a surface movable about a closed path for removing toner particles from the magnetic brush means and on to the surface of the detoning means and the improvement which comprises:

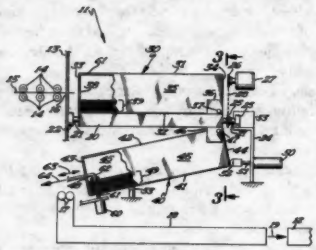
means defining apertures on the surface of the detoning means, said apertures sized to permit toner particles removed from the photoconductor to pass through said apertures;

toner conveying means for directing the toner particles from the surface of the detoning means through said apertures into a space encompassed by the surface of the detoning means.

4,601,570
PHOTOGRAPHIC MEDIA ACCUMULATOR SYSTEM

Stephen A. Bartz, Jordan, and Wayne D. Gunderson, Brooklyn Park, both of Minn., assignors to Lucht Engineering, Inc., Minneapolis, Minn.

Filed Jun. 24, 1985, Ser. No. 747,991
Int. Cl.[4] G03B *27/32, 27/52, 27/58*
U.S. Cl. 355—27 **15 Claims**

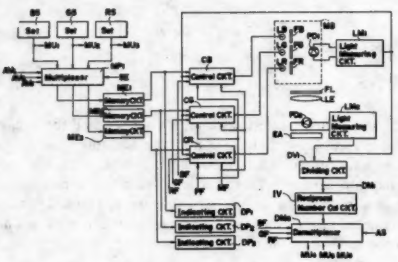


1. In a photographic exposure and development system of the type having printer means for exposing photographic media with a desired image, having processor means for developing the image exposed on said media and having accumulator means intermediate the printer means and processor means for compensating for differences in operational speed between the printer means and processor means, the improvement wherein said printer means discharges exposed photographic media in sheet form, said accumulator means comprising means accepting exposed sheets of photographic media for stacking the same in ascending chronological order from the stack bottom and means for providing access to said exposed sheets for removal in ascending chronological order at the top of said stack.

4,601,571
EXPOSURE DETERMINING DEVICE FOR AN ENLARGER

Yoshio Yuasa, Osaka, and Nobukazu Kawagoe, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 22, 1983, Ser. No. 525,565
Claims priority, application Japan, Aug. 24, 1982, 57-147247
Int. Cl.[4] G03B *27/80*
U.S. Cl. 355—38 **12 Claims**

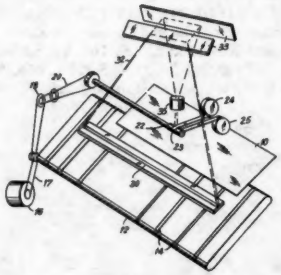


1. An exposure determining device for use in an enlarger having a light emitting device for printing a printing paper located on a predetermined plane, comprising:
- means for setting the amount of light to be emitted from said light emitting device for each of the primary colors to generate setting signals representative thereof;
- means for controlling the amount of light emission of said light emitting device for each of the primary colors in accordance with said setting signals;
- means for monitoring the amount of light emitted actually from said light emitting device for each of the primary colors to generate monitoring signals representative thereof;
- means, including a light receiving element movable on said predetermined plane, for measuring the amount of light received by said light receiving element for each of the primary colors to generate measuring signals representative thereof;
- means for calculating the ratio of said measured amount of light to said monitored amount of light for each of the primary colors to generate ratio signals representative thereof;
- means for selecting a first mode when a predetermined standard film is set in said enlarger and a second mode when a film to be printed is set in said enlarger;
- means for averaging a plurality of said calculated ratios for each of the primary colors based on said ratio signals and for memorizing averaged signals representative of said averaged ratios, said plurailty of said calculated ratios being calculated by a plurality of light emissions of said light emitting device with the position of said light receiving element being altered when said first mode is selected, and
- means for determining the proper exposure amount for each of the primary colors by means of calculation based on said averaged signals and plurality of said ratio signals calculated by a plurality of light emissions of said light emitting device with the position of said light receiving element being altered when said second mode is selected, said determining means generating determining signals each representative of said determined exposure amount for each of the primary colors.

4,601,572
MICROFILMING SYSTEM WITH ZONE CONTROLLED ADAPTIVE LIGHTING

David S. Wise, Solon, Ohio, assignor to McGraw-Hill, Inc., New York, N.Y.

Filed Apr. 9, 1985, Ser. No. 721,205
Int. Cl.[4] G03B *27/74, 27/80*
U.S. Cl. 355—68 **10 Claims**



1. A system for producing an image of a document on a photosensitive medium comprising:
- slit aperture means for providing a slit image area on said document;
- means for moving said document with respect to said slit aperture means;
- control means responsive to image density vairations along said slit image area for generating a plurality of illumination control signals, each related to the image density in a predefined respective zone on said document along said slit image area; and

a plurality of sources of illumination, each responsive to at least one of said control signals for illuminating the respective zone thereof in relationship to the control signal.

4,601,573

CONTINUOUS PHOTO MOUNT

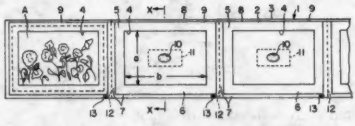
Mikio Utsugi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 9, 1984, Ser. No. 659,181

Claims priority, application Japan, Oct. 7, 1983, 58-155025[U]; Oct. 7, 1983, 58-155026[U]; Oct. 7, 1983, 58-155028[U]

Int. Cl.[4] G03B *27/62*

U.S. Cl. 355—75 **17 Claims**



1. A continuous photo mount comprising a mount body comprising a surface sheet and a rear sheet, said rear and surface sheets affixed to each other so as to form at least one pocket having an open portion whereby said pocket is adapted to receive a sheet-like object, wherein said pocket has a window for viewing said object, and at least one hole through one of said surface sheet and said rear sheet, and an adhesive means for affixing said object to said mount sheet body through at least one of said holes.

4,601,574

DISTANCE MEASURING APPARATUS

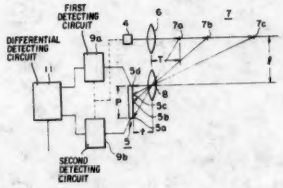
Satoshi Yamane, Kobe, and Toshitatsu Suzuki, Takarazuka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 372,817, Apr. 28, 1982, abandoned. This application Apr. 1, 1985, Ser. No. 717,604

Claims priority, application Japan, May 1, 1981, 56-66743; May 9, 1981, 56-69995

Int. Cl.[4] G01C *3/00, 5/00;* G03B *3/00*

U.S. Cl. 356—1 **9 Claims**



1. A distance measuring apparatus for measuring a distance from a reference point to a subject of interest comprising:

means for radiating an energy beam toward said subject of interest;

receiving means for receiving the portion of said energy beam reflected from said subject, said receiving means including a receiving surface defined between two extreme points and means for supplying first and second current signals with the magnitude of each of said first and second current signals being respectively determined by the location of impingement of said reflected energy beam within and in respect to said two extreme points;

first extracting means for extracting and outputting a first fluctuating component from said first current signal in the form of a voltage said first extracting means including a first logarithmic conversion circuit for receiving said first current signal, first storing means for storing a background light component prior to radiation by said energy beam and first sampling means for sampling said first fluctuating component as a difference between sid background light component stored in said first storing means and said first current signal;

second extracting means for extracting and outputting a second fluctuating component from said second current signal in the form of a voltage said second extracting means including a second logarithmic conversion circuit for receiving said second current signal, second storing means for storing said background light component prior to radiation by said energy beam and second sampling means for sampling said second fluctuating component as a difference between said background light component stored in said second storing means and said second current signal; and

a differential processing means for producing a distance signal indicating a distance to said subject by taking a difference between said first and second fluctuating components which are output from said first and second extracting means.

4,601,575

APPARATUS FOR MEASURING THE CHARACTERISTICS OF AN OPTICAL SYSTEM

Hiroshi Tamaki, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

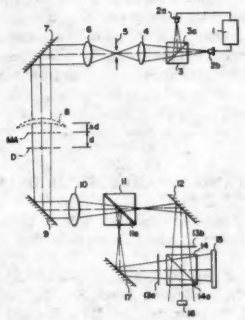
Filed Mar. 1, 1982, Ser. No. 353,505

Claims priority, application Japan, Mar. 3, 1981, 56-30223; Jun. 3, 1981, 56-85490

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.[4] G01B *9/00*

U.S. Cl. 356—124 **39 Claims**

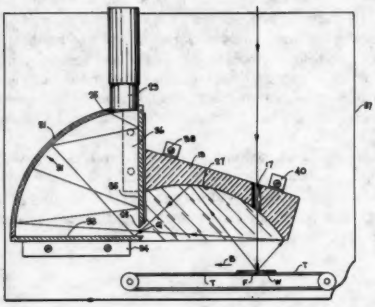


1. An apparatus for measuring the optical characteristics of an optical system, comprising a light source, collimator means for collimating a beam of light from said light source, a mask for selecting part of the light beam from said collimator means, means for holding an optical system to be tested between said collimator means and said mask, a detector for detecting the selected light beam transmitted by said mask, and a calculator for calculating the optical characteristics of said optical system to be tested on the basis of the results detected by said detector, wherein said mask includes a beam selecting pattern comprising two groups of parallel linear bands, each of said groups consisting of at least two parallel linear lines, said two groups being oriented in different directions and arranged without any intersection.

4,601,576
LIGHT COLLECTOR FOR OPTICAL CONTAMINANT AND FLAW DETECTOR

Lee K. Galbraith, Mountain View, Calif., assignor to Tencor Instruments, Mountain View, Calif.

Filed Dec. 9, 1983, Ser. No. 559,909
Int. Cl.⁴ G01N *21/00*
U.S. Cl. 356—237 **13 Claims**



1. A two-stage light collector for detecting contaminants and defects on a test surface comprising,

a light source capable of generating a narrow beam,

a support holding a test surface with a number of light scattering contaminants and defects,

scanning means for sweeping the beam in a path across the test surface,

a first light collector having an entrance aperture for admitting the beam, and having a beam exit aperture, said first light collector directing light scattered from said test surface to said beam exit aperture and

a second light collector having an entrance aperture in optical communication with the beam exit aperture of the first light collector and having a detector port distal from light entering said entrance aperture of said second light collector with light detection means mounted therein for detecting changes in light scattering from said test surface, light scattered from locations other than from said test surface having a low probability of entering said second light collector and being detected.

4,601,577
METHOD AND APPARATUS FOR DETECTING DEFECTS IN A PATTERN

Yukihiro Gotou, and Etsuji Suzuki, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 20, 1983, Ser. No. 534,119
Claims priority, application Japan, Sep. 21, 1982, 57-163204; Oct. 27, 1982, 57-187470; Jan. 24, 1983, 58-9662
Int. Cl.⁴ G01N *21/47*
U.S. Cl. 356—237 **17 Claims**

1. An apparatus for detecting a defect on a pattern having a portion extending in a first direction and a portion extending in a second direction orthogonal to said first direction comprising:

means for dark field illuminating said pattern with first rays in said first direction and at a predetermined angle with respect to the surface of said pattern and dark field illuminating said pattern with second rays in said second directions and at said predetermined angle with respect to said surface of said pattern, said illuminating means comprising a light source for irradiating rays, a slit plate having a plurality of slits through which the rays of said light source pass, and a condensing lens for directing the rays having passed through said slits to said pattern at said predetermined angle so that they form said first and second rays;

means for detecting a first image signal of said pattern when said pattern is illuminated with said first rays, and a second

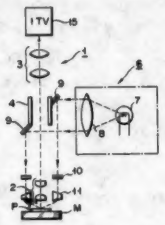


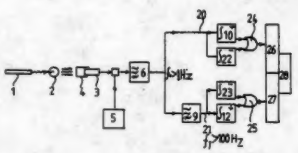
image signal of said pattern when said pattern is illuminated with said second rays; and

means for logically multiplying said first and second image signals to provide an image of said defect.

4,601,578
MEASUREMENT OF SPERM MOTILITY

James K. Woolhouse, 5 Bellwood Pl., Chedworth, Hamilton, and Murray W. Woolford, 57 Berkley Ave., Hillcrest, Hamilton, both of New Zealand

Filed May 24, 1983, Ser. No. 497,672
Claims priority, application New Zealand, May 25, 1982, 200732
Int. Cl.⁴ G01N *21/49*
U.S. Cl. 356—338 **9 Claims**



2. Apparatus for assaying the motility of sperm in a semen sample comprising:

a temperature controlled optical cell in which said sample is held in use,

a laser device which projects a beam of light at said sample,

a photodetector which receives a portion of the light scattered from said sample,

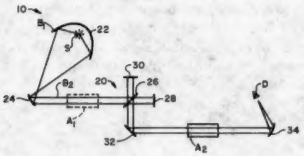
a high pass filter which receives the filtered photodetector signal as an input, a first integrator which integrates the output of the high pass filter; a second integrator with a time constant and saturation level identical to the first which integrates the photodetector signal; each integrator providing as outputs the integrator reset pulses which occur as each integrator reaches saturation; and digital counter means which counts and stores respectively integrator reset pulses in a preselected period to provide counts representative of signal amplitude, said counts being indicative of sperm activity in said sample.

4,601,579

HIGH INTENSITY FOURIER SPECTROMETER

James L. Pritchard, Norfolk, Mass.; James A. Pritchard, 22 Needham St., Norfolk, Mass. 02056, and Mary H. Pritchard, 52 Needham St., Norfolk, Mass. 02056 (Administrator of said James L. Pritchard, deceased)

Filed Nov. 4, 1983, Ser. No. 548,667
Int. Cl.[4] G01J *3/45*
U.S. Cl. 356—346 6 Claims



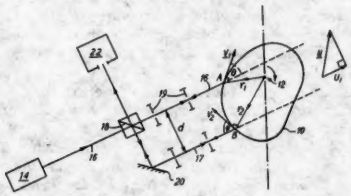
3. A system for reducing wavelength error in a beam of radiant energy caused by wobble of a Michelson interferometer moving mirror from which the beam of radiant energy is reflected, comprising in combination: first means for producing a parallel beam of a first width containing all said radiant energy, means for bringing to a focus all said radiant energy in said parallel beam of a first width, and second means for producing a parallel beam of a second width narrower than the first width containing all said radiant energy for impingement of same on said Michelson interferometer moving mirror.

4,601,580

MEASUREMENT OF OSCILLATORY AND VIBRATIONAL MOTION

Neil A. Halliwell, Southampton, England, assignor to University of Southampton, Southampton, England

Filed Aug. 16, 1983, Ser. No. 523,809
Claims priority, application United Kingdom, Aug. 18, 1982, 8223854
Int. Cl.[4] G01B *9/02;* G01P *3/36*
U.S. Cl. 356—349 9 Claims



1. A method of monitoring the rotational speed of a rotating body, the method comprising the steps of:

directing two spaced parallel beams of coherent light onto said body;

combining the light backscattered from said body along the paths of said two beams to form an optical heterodyne; and

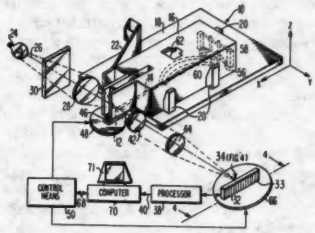
detecting intensity and frequency of the combined heterodyned light so that the heterodyne frequency provides an indication of the instantaneous rotational speed of the body.

4,601,581

METHOD AND APPARATUS OF DETERMINING THE TRUE EDGE LENGTH OF A BODY

Robert L. Covey, Cranbury, N.J.; Michael T. Gale, Wettswil, Switzerland; Istvan Gorog, Princeton, and John P. Beltz, Willingboro, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 4, 1985, Ser. No. 719,730
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—383 19 Claims



1. A method of determining the true edge length of a body subtended by two other body edges, comprising:

(a) exposing the body to a beam of light such that the edge is imaged by an optical system for projecting a linear section across said body as a focused silhouette-like image onto an array of photosensitive elements;

(b) moving said array to scan at least a portion of said edge to provide a data point of a predetermined minimum intensity level sensed by each of a respective plurality of said elements;

(c) determining a first line from said data points representing the location of said true edge;

(d) moving said array to scan said other body edges to provide a second and third plurality of data points of a predetermined intensity level;

(e) determining a second line and third line, respectively, from said second and third plurality of data points representing at least a portion of said other body edges; and

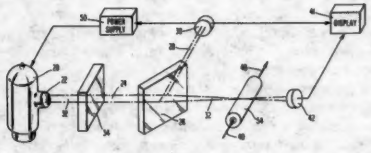
(f) extending said second and third lines to intersect said first line, the distance between said intersection points representing the true length of said body edge.

4,601,582

SPECTROPHOTOMETER

William T. Casey, Jr., Chalfont, Pa., assignor to Milton Roy Company, Ivyland, Pa.

Continuation of Ser. No. 742,633, Jun. 10, 1985, abandoned, which is a continuation of Ser. No. 455,116, Jan. 3, 1983, abandoned. This application Nov. 22, 1985, Ser. No. 800,903
Int. Cl.[4] G01J *3/51;* G01N *21/03, 21/33*
U.S. Cl. 356—414 7 Claims



1. A spectrophotometer for continuously monitoring an effect of changing parameters in an on-line process stream under exremely high pressure, comprising:

means for emitting a first beam of light having a plurality of wavelengths;

means, optically coupled to said emtiting means, for filtering

said first beam of light and transmitting a second beam of light consisting of a preselected wavelength;

means for disproportionately splitting said second beam of light into a first and second component, whereby said first component has a substantially greater intensity than said second component;

means, optically coupled to said splitting means, for measuring the intensity of said second component;

a sample cell, optically coupled to said splitting means, said sample cell comprising a pair of rigid cell members releasably joined together to form an inner cavity of substantially cylindrical shape, one of said cell members having bored therethrough an optical orifice having a preselected diameter and an axis extending transversely through the axis of said cavity, a substantially transparent tube contained within and supported by said cavity, said tube having a preselected inside diameter and wall thickness, a pair of static seal members, each attached at a respective end of said tube thereby forming a pressure seal between said tube and said cell members, and input and discharge means in communication with said tube for providing a flowpath through which the process stream may be sampled, wherein the ratio of the wall thickness of said tube to the diameter of said optical orifice is approximately 2:1 and wherein the ratio of the diameter of said optical orifice to the inside diameter of said tube does not exceed 0.75, whereby said first component is transmitted through said tube via said optical orifice; and

photodiode means, optically coupled to said sample cell and sensitive to light having said preselected wavelength, for producing a signal indicative of the amount of light absorbed by the process stream within said tube.

4,601,583

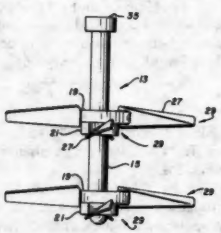
MULTI-HUBBED SEPARABLE BLADE AGITATORS

Franklyn J. Amorese, Hilton, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Jan. 28, 1985, Ser. No. 695,321

Int. Cl.[4] B01F *7/22*

U.S. Cl. 366—343 **13 Claims**



1. Agitator assembly comprising:

(a.) a hollow tube drive shaft with a closed end, coated with glass on the external surfaces thereof, said glass coating which is finished machined along the section of said drive shaft to which at least one agitator blade assembly is to be mounted to a tolerance of $\pm 0.0004''$;

(b.) at least two agitator blade assemblies, coated with glass on the external surfaces thereof, interference fitted to said finished machine section of said drive shaft, the abutting faces of said at least two agitator blade assemblies being in substantial contact with each other, each of said agitator blade assemblies comprising:

(i) a hub with an internal bore with a bore height which is no less than 1" in diameter for each $1\frac{1}{2}''$ of drive shaft diameter, said internal bore having a glass coating which is finish machined to a thickness range of 0.0400" to 0.0456", said glass coated internal bore of said hub which does not vary in size more than $\pm 0.0002''$ in diameter from the size of any other glass coated internal hub bore of any other agitator blade assembly of said agitator assembly; and

(ii) at least one blade projecting radially from said hub;

(iii) wherein each face of said hub which abuts and comes into substantial contact with a face of another hub is within $\pm 0.0010''$ of being perpendicular to the axis of said internal bore; and

(iv) wherein the wall thickness of each of said hubs is substantially greater than the wall thickness of said hollow tube drive shaft;

(c.) wherein said drive shaft is composed of metal and wherein each of said hubs is composed of the same grade of metal as each of said other hubs and wherein the coefficient of expansion and contraction of the drive shaft and each of said hubs is equivalent; and

(d.) wherein said glass coating is composed of a glass material which contains at least 60% SiO_2 and at least ten additional oxides.

4,601,584

WRIST WATCH OR CLOCK ROSARY DEVICE

Lowell E. DeWolf, 666 San Mario Dr., Solana Beach, Calif. 92075; James J. Scrudato, 2796 N. Dalenhurst Pl., Simi Valley, Calif. 93065, and Robert S. Wallace, 823 S. Longwood Ave., Los Angeles, Calif. 90005, assignors to Lowell E. DeWolf; James J. Scrudato and Robert S. Wallace, all of Solana Beach, Calif.

Continuation-in-part of Ser. No. 265,042, May 18, 1981. This application Dec. 17, 1982, Ser. No. 450,644

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.[4] G04B *47/00*

U.S. Cl. 368—10 **12 Claims**

1. In combination,

(a) a time-piece having a casing and face structure, and time indicating indicia at said face structure,

(b) energizable means having terminals proximate said face structure, said terminals defining a loop or a portion of a loop,

(c) and control means for controllably energizing said (b) means so that said terminals are succesively and controllably made visible,

(d) certain of said terminals when visible having a first chracteristics indicative of a Hail Mary prayer, and others of said terminal when visible having a second characteristic indicative of an Our Father prayer,

(e) said terminals being located proximate said time indicating indicia to be viewable when said face is observed, and said control means including a switch proximate said casing.

4,601,585

TIME DISPLAY SYSTEM

Brent L. Farley, 4215 Connecticut Ave., Baltimore, Md. 21229

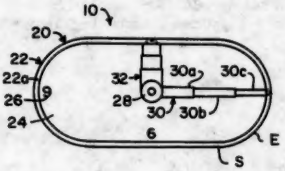
Filed Nov. 18, 1985, Ser. No. 798,908

Int. Cl.[4] G04B *19/04*

U.S. Cl. 368—80 **19 Claims**

1. In a system having: case, face, hand structure including

outer-end hand structure, and means for rotating the hand structure around the face for indicating time, the improvement comprising: means for creating the illustion that the case has at



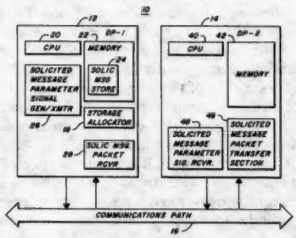
least one dimension thereacross that is too small to permit the hand structure to rotate around the face, including means for shortening the hand structure by contact with a portion of the case on said rotating.

4,601,586

SOLICITED MESSAGE PACKET TRANSFER SYSTEM

Richard G. Bahr, Framingham; Daryl F. Kinney, Holliston; Alan G. Nemeth, Framingham, and Helen S. Raizen, Jamaica Plain, all of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 10, 1984, Ser. No. 579,090
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—94 **17 Claims**



1. A system for transferring solicited message packets from at least one solicitee data processor to at least one solicitor data processor, comprising:

A. a plurality of data processors coupled on a serial communications path, each data processor including a central processing unit and an associated means for storing data,

B. allocation means associated with at least one solicitor data processor for allocating a portion of its associated storage means for storage of solicited message packets to be received from at least one of said solicitee data processors, and means for defining a sequence of operations to be performed on said received solicited message packets at said solicitor data processor, at least one of said operations being the storage operation of storing a received solicited message packet in said allocated portion, each of said solicited message packets including a predetermined header portion relating said solicited message packet to one or more associated ones of said sequences of operations,

C. solicitation means associated with said solicitor data processor for generating and transferring a solicited message parameter signal to at least one solicitee data processor, said solicited message parameter signal being representative of said predetermined header portion for said solicited message packet,

D. solicited message packet transfer means associated with said solicitee data processor, including means for receiving said solicited message parameter signal, and means responsive thereto for generating said solicited message packet, said solicited message packet including at least a predetermined header portion, and including means for transferring said solicited message packet over said communications path to said solicitor data processor, and

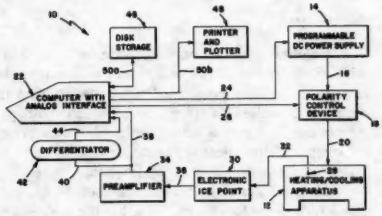
E. receiving means at said solicitor data processor for receiving said transferred solicited message packets from said communications path and for storing said received solicited message packets in said allocated portion.

4,601,587

DEVICE AND METHOD FOR DETERMINING FREEZING POINTS

Balakrishnan Mathiprakasam, Overland Park, Kans., assignor to Midwest Research Institute, Kansas City, Mo.

Filed Sep. 21, 1983, Ser. No. 534,352
Int. Cl.[4] G01N 25/02
U.S. Cl. 374—25 **50 Claims**



1. A method for determining the freezing point of a mixture having an anticipated freezing point, comprising the following steps:

(a) cooling the mixture to a temperature less than its anticipated freezing point;

(b) controllably warming the mixture by actively controlling a net heat transfer thereto to increase the temperature of the mixture at a substantially constant rate during that time when the mixture is not undergoing a phase change;

(c) identifying an instant of time when a peak rate of increase of temperature of the mixture occurs; and

(d) determining the temperature of the mixture that existed at said instant of time, wherein this temperature is substantially equal to the freezing point of the mixture, wherein said substantially constant rate of increase of temperature is selected such that regardless of the freezing point of the mixture said rate of increase of temperature is sufficiently high to render identifiable said instant of time and is sufficiently low to provide acceptable accuracy.

4,601,588

TEMPERATURE-INDICATING SHEET

Ichiro Takahara, Yao; Tomoyoshi Ono, Osaka, and Makoto Nakai, Kashihara, all of Japan, assignors to Matsumoto Kosan Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 646,990, Sep. 4, 1984, abandoned. This application Sep. 16, 1985, Ser. No. 776,217
Claims priority, application Japan, Sep. 5, 1983, 58-163754; Mar. 10, 1984, 59-45985
Int. Cl.[4] G01K 11/12
U.S. Cl. 374—106 **3 Claims**

1. A temperature-indicating sheet which contains:

(i) an organic electron-donative color precursor,

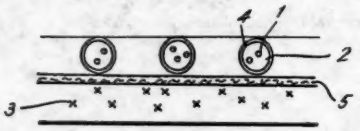
(ii) a color developing agent which when in contact with said organic electron-donative color precursor results in a change in color, said color developing agent selected from the group consisting of phenolic hydroxyl group-containing compounds, organic carboxylic acids and inorganic solid acids,

(iii) a waxy substance selected from the group consisting of

alcohol, ester, hydrocarbon, ether and ketone, which melts at a prescribed temperature,

(iv) a binder selected from the group consisting of polyvinyl acetate, vinyl acetate copolymer and acrylic ester copolymer, and

(v) a paper or non-woven fabric membrane, said waxy substance and color precursor being a mixture included in microcapsules which can be broken by outer pressure at a temperature of use, said microcapsules being adhered to said membrane through said binder at one side of said membrane, said color developing agent being adhered to



said membrane at the opposite side, so that when said microcapsules have been broken and said waxy substance is exposed to said prescribed tempratauре, said mixture becomes a molten mixture and permeates through said membrane to cause a change of color and provide an indication of the sheet temperature, the weight ratio of said microcapsules to said binder being in the range of from 30:1 to 1:2, and said membrane being permeable at a given rate to the molten mixture, having a base weight of 20–200 g/m^2 and the ratio of said base weight to membrane thickness in microns being not less than 0.3.

4,601,589

ELECTRICAL POCKET THERMOMETER WITH DIGITAL DISPLAY

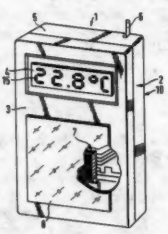
Alfred Meisner, Nuremberg, Fed. Rep. of Germany, assignor to Fa. Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed May 21, 1985, Ser. No. 736,330

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 8417518[U]

Int. Cl.^{4} G01K *1/08*; H01L *31/04*

U.S. Cl. 374—208 **9 Claims**



1. An electrical pocket thermometer with digital display, comprising a flat, rectangular casing having two large faces, said faces including a front face and a rear wall opposite said front face, said digital display being arranged on said large front face, a rod-shaped measuring sensor or probe being supported by a telescopable carrier protruding from said rear wall, a voltage-fed block of electronic analyzer and display means being electrically connected with said block, and a voltage source connected with said block for feeding voltage thereto, said voltage source being a solar cell arranged in one of said large faces of said casing.

4,601,590

FLOATING BUSH BEARING

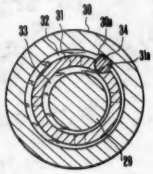
Seiji Arii, and Katsusaku Yamamoto, both of Ube, Japan, assignors to Ube Industries, Yamaguchi, Japan

Filed Aug. 16, 1985, Ser. No. 766,740

Claims priority, application Japan, Aug. 31, 1984, 59-180336

Int. Cl.^{4} F16C *17/02*

U.S. Cl. 384—99 **7 Claims**



1. A floating bush bearing comprising:

a pair of outer and inner members, one of said pair of outer and inner members being fixed while the other being rotatable, said outer member having a cylindrical inner surface while said inner member having an cylindrical outer surface and being fitted into said outer member substantially in coaxial relationship therewith;

a floating bush which is fitted between said outer and inner members and which has outer and inner cylindrical surfaces;

a flowing liquid filled in the space defined between said outer member and said floating bush and the space defined between said floating bush and said inner member;

a pair of substantially semicylindrical outer groove and a substantially semicylindrical inner groove formed in the opposed surfaces of the member which is rotatable of said pair of outer and inner members and said floating bush, the axis of said substantially semicylindrical outer and inner grooves being extended substantially in parallel with the axis of the member which is rotatable, one of said pair of substantially semicylindrical outer and inner grooves being slightly greater in diameter than another of said pair of substantially semicylindrical outer and inner grooves; and

a pin which is fitted into a substantially cylindrical hole defined by said substantially semicylindrical outer and inner grooves which are aligned with each other, a diameter of said pin being substantially equal to the diameter of one of said a pair of substantially semicylindrical outer and inner grooves which is smaller in diameter than another of said pair of substantially semicylindrical outer and inner grooves.

4,601,591

ELASTOMERIC BEARING DAMPER APPARATUS AND ASSOCIATED METHODS

E. Scott Wright, Mesa, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 14, 1984, Ser. No. 609,922

Int. Cl.^{4} F16C *27/06*

U.S. Cl. 384—536 **21 Claims**

1. Apparatus for absorbing and damping deflections of a bearing, comprising:

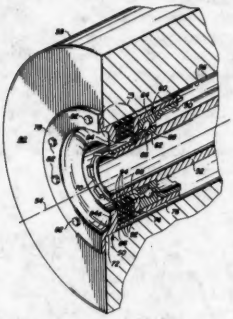
(a) a first support member adapted to be secured to a support structure;

(b) a second support member spaced apart from said first suoport member in a first direction;

(c) means for securing said second support member to a portion of a bearing for movement therewith; and

(d) a damping section positioned between and intersecuring said first and second support members, said damping section including:

(1) elastomeric means for permitting resilient deflection of said second support member relative to said first support member in a second direction generally perpendicular to said first direction in response to lateral deflection of the secured bearing, and



(2) means for maintaining said elastomeric means essentially entirely in a shear stress condition during deflection of said second support member in said second direction relative to said first support member.

4,601,592

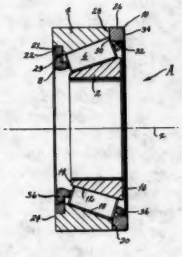
TAPERED ROLLER BEARING CAPABLE OF SUSTAINED OPERATION WITHOUT LUBRICANT REPLENISHMENT

Chester F. Jatczak; Peter W. Lee, both of Canton, and Peter S. Orvos, Uniontown, all of Ohio, assignors to The Timken Company, Canton, Ohio

Continuation-in-part of Ser. No. 359,165, Mar. 17, 1982, abandoned. This application Feb. 8, 1984, Ser. No. 578,025

Int. Cl.[4] F16C *33/58, 33/36, 33/66*

U.S. Cl. 384—564 **12 Claims**



1. A tapered roller bearing capable of operation without significant damage for at least 30 minutes without external lubrication under a PV multiple of at least 22×10^6 where P is the contact stress between its rib ring and its rollers in units of psi and V is the relative velocity between its rib ring and its rollers in units of ft/min, comprising: an inner race having an outwardly presented raceway that is tapered; an outer race having an inwardly presented raceway that is tapered and surrounds the raceway of the inner race; tapered rollers arranged in a row between the tapered raceways of the two races and contacting those raceways along their bodies, the tapered rollers being formed from wrought steel and having large and small ends; said rib ring normally mounted in a fixed position with respect to one of the races and projecting generally radially beyond the large end of the raceway for that race, the rib ring having a smooth abutment face free from "Beilby layer" and having open pores, said abutment face being presented toward the large ends of the tapered rollers and against which the rollers bear at their large ends, the rib ring being formed from a powdered steel having a density of about 70% to about 85% of its theoretical density, a liquid lubricant in the pores of the rib ring in an amount sufficient to provide emergency lubrication for at least said 30 minutes, said rib ring having a dynamic coefficient of friction in contact with said rollers which does not exceed 0.10 in the presence only of said emergency lubrication, and the rib ring being capable of sustaining a contact stress, constituting said P, of 40,000 lbs/in^2 and when moved at said velocity V relative to said rollers being capable of enduring said PV multiple of 22×10^6 for 30 minutes in absence of lubrication other than the lubricant absorbed in the pores, where P is measured in lbs/in^2 and V in ft/min.

4,601,593

HIGH QUALITY PRINTING METHOD

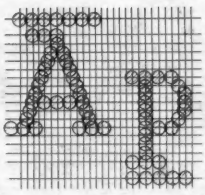
Giancarlo Collina, Cermenate, and Giannico Stefani, Arese, both of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Continuation of Ser. No. 598,625, Apr. 10, 1984, abandoned. This application Jul. 24, 1985, Ser. No. 758,860

Claims priority, application Italy, Apr. 12, 1983, 20539 A/83

Int. Cl.[4] B41J *3/10*

U.S. Cl. 400—121 **1 Claim**



1. A high quality printing method utilizing a matrix serial printer provided with N printing elements in a column arranged with a vertical pitch P centre to centre, the printing elements being shifted transversally to said column along a printing support line and being selectively actuated during said transverse movement, the printer comprising means for advancing said printing support in the direction of said column of elements for a discrete multiple quantity of an elementary advance equal to 1.5 times the vertical pitch of said elements comprising:

executing a first line printing operation through a first transverse pass of said elements;

advancing of said printing support in the direction of said elements in said column;

executing a second printing operation of said line with a second transverse pass of said elements;

said element actuation being effected by a command of a first and second succession of binary codes of N-1 bits, each succession being contained in a different table of a character description memory and read out one at a time from said memory; the first printing operation with a first pass being performed in response to each of the N-1 binary code bits of said first succession with each of the lower N-1 elements in said N elements column and the second printing operation being performed in response to each of the N-1 binary code bits of said second succession with each of the upper N-1 elements in said N elements in the column.

4,601,594

ENDLESS INK RIBBON CASSETTE HAVING SELECTIVE RIBBON TENSION CONTROL

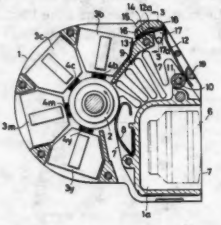
Mikio Hayashi, and Fumio Otsuka, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 565,184

Claims priority, application Japan, Dec. 24, 1982, 57-200225[U]; Dec. 27, 1982, 57-201630[U]

Int. Cl.[4] B41J *32/02*

U.S. Cl. 400—196.1 4 Claims



1. An endless ink ribbon cassette comprising: a cassette casing; an endless ink ribbon stored in the casing and having a part thereof lying outside the casing; a member disposed in the vicinity where the ink ribbon exits the casing; a resiliently deformable spring plate resiliently pressing the ink ribbon against the member to apply a tensioning force thereto; a manually turnable locking lever operative when manually turned in a given direction to resiliently deform the spring plate to thereby increase the pressure at which the ink ribbon is pressed against the member; and an abutment stationarily disposed within the cassette casing; the spring plate including at least one wedge-shaped projection engageable with the abutment during resilient deformation of the spring plate to urge the spring plate and ink ribbon against the member.

4,601,595

PAPER SHEET SETTING MECHANISM IN A PRINTER

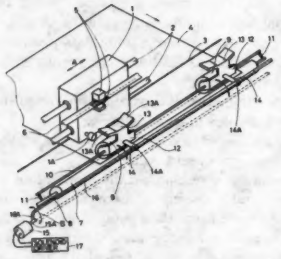
Masahiko Aiba, Nara, and Koichi Furukawa, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1985, Ser. No. 710,272

Claims priority, application Japan, Mar. 12, 1984, 59-47332

Int. Cl.[4] B41J *13/16, 13/20, 13/036*

U.S. Cl. 400—637 4 Claims



1. A paper sheet setting mechanism in a printer comprising:

a printer head slidably secured on a first shaft;

first drive means for shifting said printer head on said first shaft;

a paper feed roller disposed along said first shaft;

at least two paper pressing rollers slidably, and rotatably mounted on a second shaft which is parallel with said first shaft;

engaging means for separating each of said at least two paper pressing rollers from said paper feed roller, said engaging means secured to each of said at least two paper pressing rollers;

second drive means for rotating a third shaft around said second shaft, said third shaft is parallel with said first and second shafts;

said second drive means including stably holding means for stably holding said third shaft at a first stable position or at a second stable position around said second shaft; and

a protrusion secured to and movable together with said printer head, which contacts said engaging means when said third shaft is held at said first stable position to separate said each of said paper pressing rollers from said paper feeding roller and to slide each of said paper pressing rollers along said second shaft.

4,601,596

TYPING AND ERASING DEVICE FOR PRINTING MACHINES

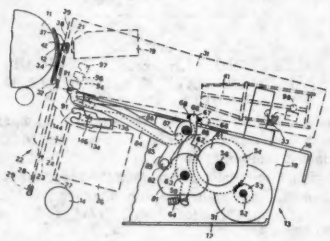
Pietro Musso, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Mar. 7, 1984, Ser. No. 586,967

Claims priority, application Italy, Mar. 7, 1983, 67255 A/83

Int. Cl.[4] B41J *33/34, 33/14*

U.S. Cl. 400—697.1 9 Claims



1. A typing and erasing device for printing machines of the type comprising a platen which defines a typing point; an electric motor having a motor shaft selectively rotatable in one or another direction by said motor; a typing ribbon having a plurality of tracks which can be selected for the printing of characters; a typing ribbon carrier cooperating with the typing ribbon and oscillatable for positioning a given area of each one of said plurality of tracks in front of the typing point; a rotatable actuating member having an active profile including a plurality of rest portions and a plurality of operative portions of different lift, wherein said active profile is operatively connected with the typing ribbon carrier upon rotation of said actuating member to reproduce in sequence oscillating movements of the typing ribbon carrier to cause in sequence viewing of the typing point and typing of characters through the given area of said plurality of tracks; a correcting ribbon for correction or deletion of typed characters; a correcting ribbon carrier cooperating with the correcting ribbon to dispose a given area of said correcting ribbon into a working position parallel and overposed to said given area of the typing ribbon and wherein said correcting ribbon carrier is actuatable for moving the given area of said correcting ribbon from a rest position wherein the correcting ribbon is away from the typing point to a working position wherein said given area of the correcting ribbon is in front of the typing point; a cam follower for actuating said correcting ribbon carrier; a rotatable control member comprising two cam profiles which have a common portion and are connected therebetween to be selectively engageable by said cam follower in dependence on the direction of rotation of said control member, wherein the engagement of one of the two cam profiles by said cam follower moves the correcting ribbon carrier for positioning the given area of the correct-

ing ribbon in front of the typing point and wherein the engagement of said cam follower with another of the two cam profiles causes the correcting ribbon carrier to be held in the rest position with the correcting ribbon away from the typing point; wherein the other of the two cam profiles of the control member is of constant lift and the one of the two cam profiles is eccentric with respect to the other profile and said two cam profiles form two interconnected grooves, wherein the correcting ribbon carrier comprises an element housed in the common portion of the two cam profiles and which can engage the other profile of constant lift or the eccentric profile when the control member rotates in the clockwise direction or in the counterclockwise direction, respectively, and wherein a correcting ribbon feed mechanism is connected with the correcting ribbon carrier and feeds the correcting ribbon upon the movement of the correcting ribbon to its working position; synchronizing means connecting said motor shaft with said actuating member and said control member to synchronize the actuating member with the control member such that a complete rotation of said actuating member corresponds with a partial rotation of said control member causing the cooperation of said typing ribbon carrier with said active profile from one to another rest portion through one of said operative portions, wherein when the electric motor rotates the control member in said one direction the given area of said correcting ribbon is positioned into its working position independently of the selected track of the typing ribbon, and wherein when the electric motor rotates the control member in the other direction said correcting ribbon is held in its rest position while the actuating member moves the typing ribbon carrier for positioning in sequence the given area of said plurality of tracks of the typing ribbon in front of the typing point.

4,601,597

APPLICATOR FOR HOT-MELT ADHESIVE

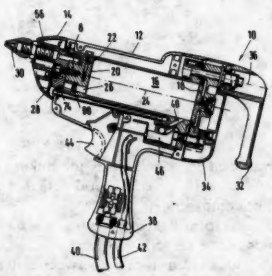
Wilhelm Bertram; Alfred Böttcher, and Carl Siegmann, all of Bremen, Fed. Rep. of Germany, assignors to Heinrich Buhnen KG, Bremen, Fed. Rep. of Germany

Filed May 10, 1984, Ser. No. 608,860

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317135

Int. Cl.⁴ B67D *5/62*

U.S. Cl. 401—1 **11 Claims**



1. An applicator for a hot-melt adhesive, comprising:

a tank for the adhesive;

a heating block bordering on said tank;

a nozzle;

a maze attachment detachably connected with said heating block and fluidly connected to said nozzle, and including a maze of successive thin ribbon-shaped annular channels extending about at least a portion of said heating block and fluidly communicating with one another, formed by said heating block and said maze attachment when connected;

an axial channel through said heating block extending from said tank to said maze;

and means for forcing the molten adhesive in said tank through said axial channel, through said maze and through said nozzle.

4,601,598

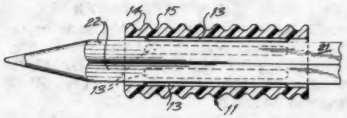
FINGER GRIPPING DEVICE

Allan E. Schwartz, 3 Bristol Pl., Yonkers, N.Y. 10710, and Richard E. Frenkel, 33 Park Rd., Scarsdale, N.Y. 10583

Continuation-in-part of Ser. No. 527,019, Aug. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 367,379, Apr. 12, 1982, abandoned. This application May 11, 1984, Ser. No. 609,230

Int. Cl.⁴ B43K *23/00*

U.S. Cl. 401—6 **5 Claims**



1. A finger-gripping device for use as a removal attachment to a writing implement comprising a one piece cylindrical body member made of flexible material, and said cylindrical body member having an internal bore of uniform diameter along the entire length of said cylindrical body member, a plurality of circumferential ribs axially spaced along the outside surface of said cylindrical body member forming a finger supporting surface when said cylindrical body member is carried on a writing implement, each said circumferential rib lying in a plane perpendicular to the axis of said cylindrical body member, each said plane being equally spaced between adjacent planes and parallel to each other plane, said ribs formed by closely spaced peaks and valleys interposed between said peaks, the outside diameter of each of said peaks of each of said circumferential ribs being the same so that said gripping device is of uniform size, and six raised longitudinally extending ribs oriented in parallel with each other and parallel to the longitudinal axis of said cylindrical body member being equally spaced apart along the inside surface of said cylindrical body member, each of said raised longitudinally extending ribs being of uniform height throughout its length, said height of each raised longitudinally extending rib being the same as the height of each other raised longitudinally extending rib.

4,601,599

BALL-POINT PEN

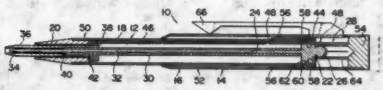
Hiroyasu Katoh, Takasaki, Japan, assignor to Katoh Kinzoku Kogyo Kabushiki Kaisha, Tomioka, Japan

Filed Sep. 13, 1984, Ser. No. 650,410

Claims priority, application Japan, Dec. 27, 1983, 58-248952; Mar. 23, 1984, 59-55340

Int. Cl.⁴ B43K *5/16, 7/12, 24/02*

U.S. Cl. 401—99 **13 Claims**



1. A ball-point pen, comprising:

an elongate telescopic body including a front holder portion, and a rear holder portion fitted on the front holder portion to be movable axially between a compressed position and a stretched position relative to said front holder portion;

a ball-point pen refill disposed in the front holder portion and having a refill tip protruding from an opening at one end of the front holder portion remote from said rear holder portion;

concealing means a part of which movably extends from the

opening at said one end of said front holder portion for concealing the refill tip of the ball-point pen refill when the rear holder portion is moved to the compressed position, and for exposing the refill tip when the rear holder portion is moved to the stretched position, said concealing means including means for biasing the extending part thereof toward a retracted position to expose the refill tip when the rear holder portion is at said stretched position; and

retaining means at the other end of said front holder portion for holding the rear holder portion in the compressed position when the rear holder portion is moved to the compressed position.

4,601,600

CLAMP FASTENER

Bo A. E. Karlsson, Spånga, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

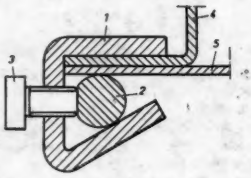
PCT No. PCT/SE83/00384, § 371 Date Jun. 13, 1984, § 102(e) Date Jun. 13, 1984, PCT Pub. No. WO84/01984, PCT Pub. Date May 24, 1984

PCT Filed Nov. 8, 1983, Ser. No. 621,920

Claims priority, application Sweden, Nov. 17, 1982, 8206559

Int. Cl.⁴ F16D *1/00*

U.S. Cl. 403—338 **4 Claims**



1. A clamp fastener for clamping two plates together comprising an elongated member of U-shaped cross-section including a base and two legs extending from said base to converge towards one another, the plates which are to be clamped together being disposed as a unit between said legs in contact with one of said legs, a rod disposed between said legs for and configured for tangentially contacting the plates and the other of said legs, said rod being displaceable between said legs to vary the distance between the rod and the base and pressure means supported by said elongated member for displacing said rod away from said base to press said plates together by a wedging action of the rod between the convergent lens.

4,601,601

ROTARY ANTI-BACKLASH COMPONENT

Norman Morris, Buckingham, England, assignor to Leslie Hartridge Limited, Buckingham, England

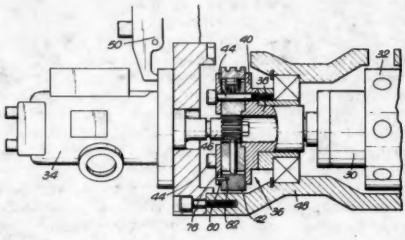
Filed Jul. 6, 1984, Ser. No. 628,956

Claims priority, application United Kingdom, Jul. 20, 1983, 8319622

Int. Cl.⁴ B25G *3/28;* **F16B** *3/00*

U.S. Cl. 403—359 **10 Claims**

1. A rotary anti-backlash component adapted to engage a rotary drive component so that rotation of one of the components causes rotation of the other, the anti-backlash component comprising: (a) an engagement member; (b) faces of said engagement member which, when the latter is in use, abut faces of such a rotary drive component to effect a driving engagement between said two components; (c) at least one fixing part of said anti-backlash component which engages said engagement member, and which also engages such a drive component when the anti-backlash component is in use to inhibit backlash between said two components for a predetermined sense of rotation of said anti-backlash component relative to itself; (d) a first engagement side of said anti-backlash component which faces the direction of movement of said anti-backlash component as the latter is brought into engagement with such a drive member for rotation thereof in one sense of drive; and (e) a second engagement side of said anti-backlash component,



which is on the other side thereof to said first engagement side, whereby said anti-backlash component is so constructed that it can be disengaged from such a drive component, turned around back-to-front and re-engaged, to allow the sense of drive to be reversed.

4,601,602

TIE ROD JOINT

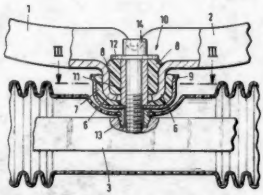
Frank D. Schnitzler, Hilden, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co., KG, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,783

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327550

Int. Cl.⁴ F16C *11/06;* **B62D** *5/06*

U.S. Cl. 403—56 **10 Claims**



1. A tie rod joint motor vehicles for linking spaced inner ends of two tie rods to a steering rod actuated by a steering gear, said joint comprising:

outer and inner bearing parts between which the spaced inner ends of the tie rods project,

first resilient inlay means located between said outer bearing part and said spaced inner ends of said tie rods and second resilient inlay means located between said inner bearing part and said spaced inner ends of said tie rods,

a tension bolt arrangement including at least one tension bolt for fastening to the steering rod and prestressing said resilient inlay means,

said tie rods being U-shaped in cross section and having a main portin with the respective inner ends thereof offset from said main portion,

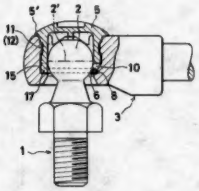
said outer bearing part being cup-shaped, said offset inner ends projecting into said cup-shaped outer bearing part, and

said inner bearing part comprising at least one socket for receiving said one tension bolt.

4,601,603
BALL JOINT

Hiromichi Nakayama, Nagoya, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Aug. 5, 1985, Ser. No. 762,179
Claims priority, application Japan, Aug. 13, 1984, 59-122878[U]
Int. Cl.⁴ F16C *11/06*
U.S. Cl. 403—143 3 Claims

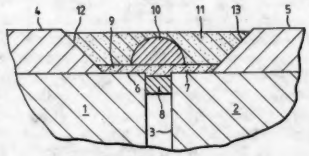


1. A ball joint comprising a ball stud having a ball at one end; a socket with an accommodating section for accommodating said ball and formed as a vertical passage through its one end, a lower end opening of said accommodating section being slightly greater than the diameter of said ball, said accommodating section having a cylindrical region found above said lower end opening and terminating at an annular seat provided on a portion thereof with a stopper; an elastic ring-like member mounted on said annular seat of said socket, said ring-like member being cut away to form a gap therein; and a cap rotatably fitted in said accommodating section of said socket from above and having a flange surrounding said accommodating section and a stopper cooperating with said stopper formed on said annular seat of said socket; said cap being fitted in said accommodating section of said socket so that said stopper on said annular seat of said socket and said stopper of said cap are located in said gap of said elastic ring-like member, whereby the diameter of said elastic ring-like member can be varied by turning said cap.

4,601,604
EXPANSION JOINT

John R. G. Clark, and Philip J. Wade, both of Frome, England, assignors to ALH Systems Limited, Wiltshire, England

Filed Jul. 25, 1983, Ser. No. 516,852
Claims priority, application United Kingdom, Jul. 23, 1982, 8221352
Int. Cl.⁴ E01C *11/02, 11/10*
U.S. Cl. 404—69 10 Claims



1. An expansion joint for joining two sections of a roadway, such sections having opposing sides, defining a channel between said sections, said expansion joint comprising:

a plug for sealing said channel;

a set fluid-polymer which sets in situ in said channel, said set fluid-polymer being located in said channel above said plug, such set fluid-polymer adhering to said sides of said sections for holding said joint in said channel; and

a core in said set fluid-polymer said core being more plastic and less elastic than said set fluid-polymer.

7. A method of forming an expansion joint for joining two sections of a roadway, said sections having opposing sides defining a channel between said sections, the method comprising:

fitting a plug in said channel, said plug sealing said channel;

pouring a first layer of fluid-polymer into said channel above said plug, said first layer of fluid-polymer when set adhering to said sides of said sections;

locating a core on said first layer of fluid-polymer;

pouring a second layer of the fluid-polymer into said channel above said first layer of fluid-polymer to a depth sufficient to cover said core; and

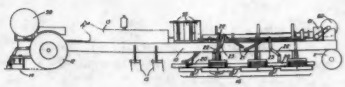
allowing said second layer of fluid-polymer to set said second layer of fluid-polymer when set adhering to said sides of said sections;

wherein said core is more plastic and less elastic than the fluid-polymer of said first layer and said second layer of fluid-polymer when said first layer and said second layer of fluid-polymer are set.

4,601,605
ROADWAY SURFACE RECONDITIONING APPARATUS

Stephen P. Damp, Willowdale; Harvey G. Johnson, Toronto, and Allen A. Neufeldt, Willowdale, all of Canada, assignors to Johnson Re-Cycling International Inc., Toronto, Canada

Filed Nov. 26, 1984, Ser. No. 674,974
Claims priority, application Canada, Jul. 20, 1984, 459344
Int. Cl.⁴ E01C *23/14*
U.S. Cl. 404—95 9 Claims



1. In a roadway surface reconditioning apparatus, a heater assembly for mounting in a location closely above an asphalt or like bituminous roadway surface for directing large quantities of radiant heat downwardly towards such surface for softening the same for subsequent scarifying, and mobile support means for causing said heater assembly to travel along the roadway in such location;

wherein the heater assembly comprises

(a) a plurality of luminous wall heaters each mounted in a steel frame, each supplied with air/gas mixture and each consisting of a plurality of porous fire bricks through which such mixture passes and on the downwardly facing surfaces of which such mixture burns to direct radiant heat to the roadway surface, each heater further having porous side walls projecting closer to the roadway surface than said bricks and supplied with air for forming a downward curtain of air to inhibit sideways escape of heat from the region beneath the heater and to cool and protect the steel frame,

(b) said heaters being assembled into at least two banks of heaters, each bank extending in the transverse direction across the apparatus, and the banks being spaced apart from each other in the direction of travel along the roadway to provide a heat soak area between these two banks,

(c) heat deflectors extending for the full length of the heater banks in said transverse direction and bridging the two heater banks in the travel direction whereby to return heat to those parts of the roadway surface that are momentarily located between the heater banks as the apparatus travels along the roadway and to protect portions of the apparatus above the heaters and the surrounding environment from the heat, and

(d) means mounting said heater banks on said mobile support means to be adjustable in the travel direction and for changing the size of the heat deflectors in the travel direction for varying the spacing between the banks of heaters and hence the length of such soak area

in the travel direction for accommodating the apparatus to variations in the nature and dimensions of the roadway surface, the depth of scarification required and ambient temperature,

(e) said heat deflectors bridging all the heater banks in the travel direction whereby uninterruptedly from one end of the heater assembly to the other heat is directed downwardly towards the roadway surface and portions of the apparatus above the heaters are protected.

4,601,606

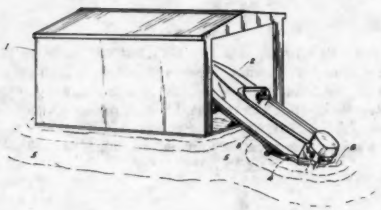
APPARATUS FOR LOADING AND STORING BOATS

Beatie Eason, P.O. Box 7323, Monroe, La. 71203

Filed Dec. 4, 1984, Ser. No. 677,791

Int. Cl.[4] B63B *35/52*

U.S. Cl. 405—1 **4 Claims**



1. An apparatus for loading a boat from a body of water into a boathouse having a floor above the surface of the body of water, said apparatus comprising:

(i) carriage means adapted for receiving the hull of a boat, the said carriage means being pivotable about a horizontal axis of rotation and being slidable forward and backward along a line perpendicular to the horizontal axis of rotation, and the said carriage means having:

(a) a channel frame having a bottom surface and two side surfaces,

(b) roller means adapted for rollably receiving the hull of a boat over the bottom surface of the channel frame,

(c) outrigger means attached to the side surfaces of the channel frame and adapted for stabilizing a boat rolled onto the channel frame and for stabilizing the channel frame on the floor of a boathouse,

(d) tensionable latching means for latching the channel frame to inhibit forward sliding of said channel frame, the said latching means being unlatchable by backward sliding of said channel frame,

(e) tensioning means for inhibiting forward and lateral sliding of said channel frame, the said tensioning means being releasable by backward sliding of the said channel frame, said tensioning means being releasable simultaneously with unlatching of said tensionable latching means;

(ii) guiding means for slidably receiving the channel frame along a line perpendicular to the horizontal axis of rotation; and

(iii) winching means for winching the channel frame forward and backward along the guiding means for tensioning the latching means and for selectively retaining the channel frame from backward movement.

4,601,607

MINE SHAFT GUIDE SYSTEM

Richard P. Lehmann, Iron Mountain, Mich., assignor to Lake Shore, Inc., Iron Mountain, Mich.

Filed Feb. 19, 1985, Ser. No. 702,910

Int. Cl.[4] E21D *1/00*

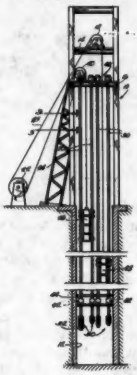
U.S. Cl. 405—133 **6 Claims**

1. In combination with a mine shaft arrangement for an underground mine having a headframe above the surface at the shaft opening, a guide system comprising,

a plurality of tubular pipe guides in said shaft,

each guide comprising a multiplicity of pipes threaded one to another to provide a smooth exterior surface at each threaded joint and depending below the normal range of conveyance travel in the shaft,

means suspending each guide from the headframe, said means including a substantially solid bar depending from



said headframe and threadably connected to the uppermost pipe,

a bushing positioning each pipe guide relative to the shaft, each bushing being fixed in the shaft below said range with the associated pipe guide passing loosely therethrough to permit vertical movement of the pipe guide relative to the bushing,

a conveyance suspended from the headframe and guided by the pipe guides, said conveyance having guide bushings slideably engaging each of the pipe guides.

4,601,608

SUBSEA HYDRAULIC CONNECTION METHOD AND APPARATUS

Arthur G. Ahlstone, Ventura, Calif., assignor to Shell Offshore Inc., Houston, Tex.

Filed Feb. 19, 1985, Ser. No. 703,012

Int. Cl.[4] F16L *1/04*

U.S. Cl. 405—169 **13 Claims**

1. Method of supplying pressurized hydraulic fluid to the hydraulic actuators of hydraulically-actuated devices carried by a subsea equipment assembly located beneath the surface of a body of water, said subsea equipment assembly carrying a receptacle having an open bottom and a chamber defined upwardly therein, said receptacle including hydraulic fluid connection means therein, said hydraulic fluid connection means being in fluid communication with at least one of said hydraulic actuators of at least one of said hydraulically-actuated devices, said method comprising;

above the surface of said body of water, providing a buoyant hydraulic fluid supply connector apparatus, having hydraulic fluid passages and hydraulic fluid connection means,

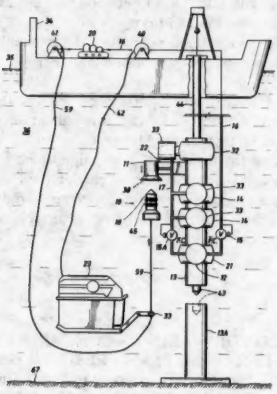
lowering said buoyant apparatus downwardly through said body of water,

positioning said buoyant apparatus substantilly centrally beneath said receptacle chamber,

floating said buoyant apparatus upwardly into said receptacle chamber,

operatively positioning said buoyant apparatus hydraulic fluid connection means adjacent said hydraulic fluid connection means located within said receptacle, and

providing a supply of pressurized hydraulic fluid through said hydraulic fluid passages of said buoyant apparatus



and said receptacle to at least one of said hydraulic actuators of said hydraulically-actuated devices carried by said subsea equipment assembly.

4,601,609

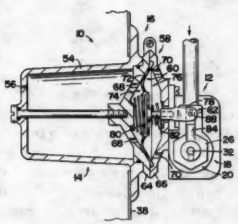
BUOYANCY DEVICE

Robert W. Hyde, 9340 W. Putter Ct., Crystal River, Fla. 32629

Filed Apr. 29, 1985, Ser. No. 728,694

Int. Cl.[4] B63C *11/02*

U.S. Cl. 405—186 **4 Claims**



1. A hydrostatically controlled buoyancy compensator to maintain a predetermined buoyancy for an aquatic diver using a buoyancy device comprising a control valve and pressure equalization chamber operatively coupled together by a control valve actuator; said control valve comprises a control valve housing having a multiple position valve body movably disposed therein; said control valve housing includes a regulator passage, buoyancy device passage and vent passage formed therein and said multiple position valve body includes a regulator channel and vent channel formed therein to selectively feed pressurized air from an external source to the buoyancy device and from the buoyancy device to the water; said pressure equalization chamber comprises a hollow constant volume pressure equalization housing; said control valve actuator comprises a hollow control valve actuator housing having a multiple position valve positioner movably disposed therein and a valve actuator coupler operatively coupled between said multiple position valve positioner and said multiple position valve body, said hollow control valve actuator housing includes a pressure equalization chamber passage and an external passage formed therein in fluid communication with said pressure equalization chamber and water respectively such that said multiple position valve positioner continuously senses the pressure differential between the water and said pressure equalization chamber through said external passage and said pressure equalization chamber passage respectively whereby as the diver descends the increased water pressure causes said multiple position valve positioner to move to a pressuration position to operatively align said regulator channel with said buoyancy device passage to feed pressurized air from the diver's regulator to the buoyancy device through said regulator passage and as the diver ascends the decreased water pressure causes said multiple position positioner to move to a depressuration position to operatively align said vent port with said vent passage and said buoyancy device passage to expel air from the buoyancy device to maintain the volumetric displacement of the buoyancy substantially constant.

4,601,610

APPARATUS AND METHOD FOR UNDERWATER VALVE COMPONENT ASSEMBLY AND DISASSEMBLY

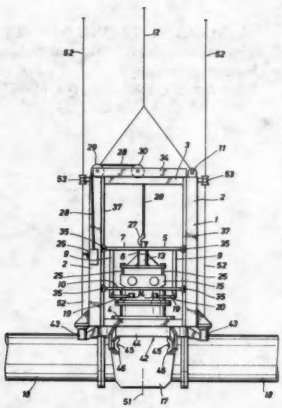
Colin T. Campbell; Richard J. Clements; John F. Robinson, and Alan J. Waring, all of Chester, England, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 4, 1985, Ser. No. 698,197

Claims priority, application United Kingdom, Jun. 5, 1984, 8414345

Int. Cl.[4] B63C *11/00*; F16L *1/04*

U.S. Cl. 405—188 **9 Claims**



1. Apparatus for removing a component from, or placing a component on, an underwater valve, located on the ocean floor beneath a floating vessel, said apparatus comprising:

base means attachable in a preferred aligned orientation to said underwater valve,

a gantry lowerable through the water for engaging said base,

hoisting cable connection means carried by the gantry for connecting a hoisting cable to the gantry,

a sliding frame carried by, aligned, and slideably engaged with said gantry,

docking means carried by the gantry for alignment and engagement of the gantry on said base, and alignment of said sliding frame with respect to said underwater valve,

component securing means carried by said sliding frame, for engaging, aligning and securing said component to said sliding frame, and

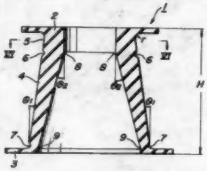
sliding frame dislacement means operatively engaged between said gantry and said sliding frame for displacing the sliding frame relative to the gantry.

4,601,611

MARINE FENDER

Satoshi Tagomori, Yokohama, and Hisaya Uruta, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 10, 1984, Ser. No. 629,382
Claims priority, application Japan, Aug. 22, 1983, 58-151485
Int. Cl.[4] E02B *3/22;* B63B *59/02*
U.S. Cl. 405—215 10 Claims



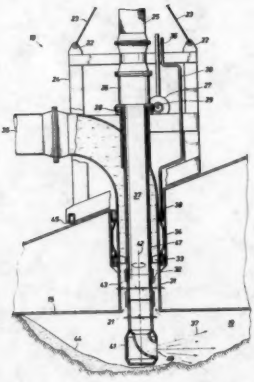
1. A marine fender comprising; a hollow tapered body of an elastic material having a relatively small elastic coefficient, said body having a shock-receiving side and a fastening side; the thickness of the hollow tapered body gradually thickened from the shock-receiving side toward the fastening side, said hollow tapered body provided at its outer periphery with a groove formed at a given position near the shock-receiving side, and said hollow tapered body having a truncated octapyramidal form at its outer surface and a truncated conical form at its inner surface.

4,601,612

SANDJET ROTATING NOZZLE

Matthew J. Primrose, Sarawak, Malaysia, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 25, 1985, Ser. No. 694,737
Int. Cl.[4] E02D *7/24*
U.S. Cl. 405—226 7 Claims



1. A method of completing a foundation beneath a gravity foundation marine structure located in a body of water having an ocean floor, said structure having a substantially flat extensive lower surface and a plurality of sandjet stinger throughbores defined through said lower surface of said structure, said method comprising,

placing said structure upon the ocean floor with the lower surface of said structure in contact with portions of the ocean floor,

lowering a sandjet stinger through at least one of said stinger throughbores, said sandjet stinger having an upper and lower end and a longitudinal axis,

forming a suspension of particulate material such as water as a carrier fluid and sand as a particulate material carried by said water, at a location above the surface of the water,

flowing such suspension downwardly through said sandjet stinger and into a void between said structure lower surface and said ocean floor,

allowing a substantial portion of the particulate material to settle out of the suspension and deposit on said ocean floor,

allowing a substantial portion of the carrier fluid to exit upwardly from said void through at least one of said sandjet stinger throughbores,

continuing the flowing of suspension, depositing of particulate material, and exiting of carrier fluid, and

building an aggregation of deposited material reaching from said ocean floor to said lower surface of said gravity foundation marine structure.

4,601,613

METHOD FOR MAKING A CONCRETE OR SIMILAR PILLAR ON SITE, AND RESULTING PILLAR

Chitis Wolf, Naples, Italy, assignor to Fondedile S.p.A., Italy

Filed Apr. 19, 1984, Ser. No. 602,078
Claims priority, application Italy, Apr. 19, 1983, 40416 A/83
Int. Cl.[4] E02D *5/46*
U.S. Cl. 405—239 5 Claims

1. A method for making a concrete pillar for foundations, ground reinforcement and other underground works comprising forming an excavation by means of a pressurized fluid sent through at least a nozzle placed at the lower end of a rotating tool having a reduced diameter as compared with that of the pillar to be built within the excavation while at the same time the excavation opening thus obtained is progressively filled from the top with aggregate for occupying the excavation opening and increasing the excavating capacity of the tool; then injecting a pressurized binding mixture in the filled excavation opening through at least another lower nozzle in the rotating tool while the rotating tool is extracted from the excavation.

4,601,614

ROCKBOLT

William L. Lane, Box 373, Viburnum, Mo. 65566, and Donald L. Lewis, 111 Birch St., Belgrade, Mo. 63622

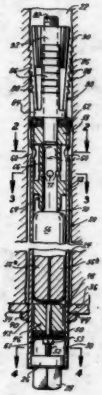
Filed Feb. 22, 1984, Ser. No. 582,276
Int. Cl.[4] E21D *20/02*
U.S. Cl. 405—261 23 Claims

1. A rockbolt for installation in a bore in the roof of an underground excavation to support the roof, comprising:

a sleeve insertable into the bore having an upper and a lower end and means for defining at least one port in the sleeve near the upper end;

a plunger in the sleeve sealingly engaging the sleeve but slideable in response to applied fluid pressure;

hardenable binder material in the sleeve between the port and the plunger and;



means for applying fluid pressure to the plunger to extrude the binder material from the port.

4,601,615

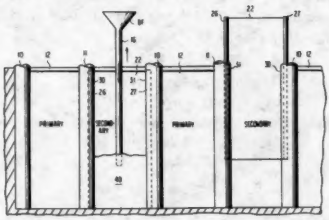
ENVIRONMENTAL CUT-OFF FOR DEEP EXCAVATIONS

Nicholas J. Cavalli, Yonkers, N.Y., assignor to FINIC, B.V., Rotterdam, Netherlands

Filed Feb. 22, 1983, Ser. No. 468,724

Int. Cl.[4] E02D *5/20*

U.S. Cl. 405—267 **14 Claims**



1. In a method of making a liquid impervious barrier in the earth wherein a narrow trench is formed by slurry trench excavation and a plastic sheet is embedded in the backfill material filling said narrow trench, the improvement in the embedment of said plastic sheet in said backfill comprising,

(a) dividing said plastic sheet into primary and secondary panel sections,

(b) sealingly securing the lateral ends of said primary panel sections of plastic sheet to facing surfaces of pairs of spaced apart primary plastic tubular members, said pairs of spaced apart primary plastic tubular members having slots in surfaces opposite the surfaces to which said lateral ends have been sealingly secured and a dimension in a direction transverse to the length of said narrow trench at least equal to the width of said narrow trench to form primary panel elements,

(c) sealingly securing the lateral ends of said secondary panel sections of plastic sheet to the facing surfaces of a pair of secondary rigid plastic members, to form a secondary panel elements,

(d) inserting at least a pair of said primary panel elements as formed in step (b) into the slurry filled trench in spaced apart relation with the slots in said primary tubular members of said pair of primary panel sections facing each other,

(e) displacing the slurry from said narrow trench between each said pair of spaced apart primary tubular members with a backfill material, said spaced apart tubular members serving as end stops for the backfill materials,

(f) inserting one of said secondary panel elements between said inserted pair of primary panel elements with said secondary tubular member telescoping within the space bounded by said primary tubular members, said plastic panel section passing through said slots, respectively, and

(g) sealingly filling the remaining space between said primary plastic tubular members and secondary plastic rigid plastic members and bounded by said primary tubular members.

4,601,616

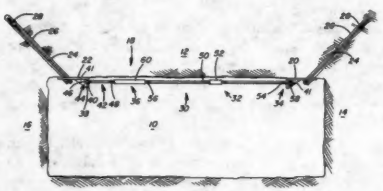
ROOF SUPPORT SYSTEM FOR A MINE AND THE METHOD AND TOOLING FOR PROVIDING THE SAME

Ken Barish, Indiana, and Paul Yacisin, Patton, both of Pa., assignors to Jennmar Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1985, Ser. No. 711,303

Int. Cl.[4] E21D *20/00, 21/00*

U.S. Cl. 405—288 **14 Claims**



1. An improved roof support system for a mine or the like of the type which includes a pair of plates secured to a roof of said mine at opposite sides thereof adjacent opposing ribs of said mine and a horizontal, transverse reinforcing member extending between said pair of said plates, said improvement comprising:

said reinforcing member including a first rod means having a first end secured to a first of said pair of said plates and a second end extending toward a second of said pair of said plates;

said second plate having a vertical portion thereof with a transversely extending opening therethrough;

said reinforcing member including a second rod means having a first end with an integral enlarged head portion with torque applying surfaces thereon, said first end being located in abutting relation with said vertical portion of said second plate with said second rod means extending through said opening with a second end thereof extending toward said first plate; and

said second ends of said first and said second rod means including mating threaded means thereon for coupling said first and said second rod means together to form said reinforcing member which is capable of producing tension between said first and said second plates so that said tension may be varied by rotation of said enlarged head of said second rod means relative to said first rod means.

4,601,617
DEVICE FOR INTRODUCING DOSED QUANTITIES OF PULVERIZED SOLID MATERIALS INTO A CARRIER GAS STREAM

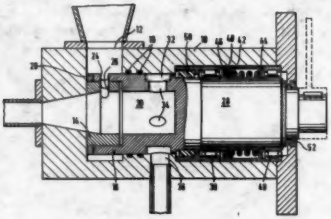
Edouard Legille, Luxembourg; Léon Ulveling, and Pierre Mailliet, both of Howald, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Apr. 10, 1985, Ser. No. 721,566

Claims priority, application Luxembourg, Apr. 11, 1984, 85299

Int. Cl.[4] **B65G** *53/46*

U.S. Cl. 406—129 **6 Claims**



1. A device for introducing pulverized materials in a carrier gas stream comprising:

housing means, said housing means having an axial flow passage for a pressurized carrier gas stream;

aperture means in said housing means for delivery of pulverized material;

inner sleeve means in said housing means and extending across said aperture means, said inner sleeve means having an axial bore, said bore providing a passage for the carrier gas stream;

outer sleeve means, said outer sleeve means being coaxial with said inner sleeve means and extending across said aperture means, at least one of said outer and inner sleeve means being rotatable about its longitudinal axis;

means for rotating at least one of said outer and inner sleeve means;

at least a first slot on said inner sleeve means and at least a second slot on said outer sleeve means, said first and second slots being capable of mutual overlapping alignment with each other and with said aperture means to define a variable sized passage whereby pulverized material is delivered therethrough to said carrier gas stream;

said rotatable sleeve means forming a portion of a drive shaft, said drive shaft being coaxially mounted in said housing means and being connected to said rotating means, said shaft having freedom of movement in the axial and angular directions;

bearing means for coaxially mounting said drive shaft in said housing means; and

spring means disposed between one end of said housing means and said shaft.

4,601,618
PILOT HOLE LOCATOR AND DRILL GUIDE AND METHOD

Paul A. McEldowney, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 27, 1985, Ser. No. 706,005

Int. Cl.[4] **B23B** *49/02*

U.S. Cl. 408—1 R **14 Claims**

10. A method of locating a pilot hole that extends only part of the way through a workpiece, and of guiding a drill to extend said hole all the way through the workpiece, said method comprising:

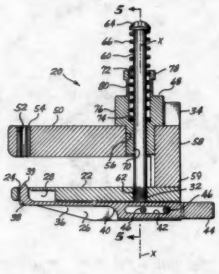
providing opposing jaws movable toward and away from each other along an axis, and providing an opening through each such jaw generally parallel to said axis, said openings being aligned with each other;

providing resilient means for urging the jaws toward each other;

positioning a pilot in a use position in which it projects from one of said openings toward the opposing jaw;

applying an opening force to move the jaws away from each other against the force of the resilient means;

with the jaws moved away from each other, positioning the jaws with the workpiece therebetween and the pilot projecting into the pilot hole;



with the jaws so positioned, removing the opening force to allow the force of the resilient means to move the jaws toward each other and clamp the workpiece therebetween; and

with the workpiece clamped between the jaws:

moving the pilot out of its use position and away from said one opening;

introducing a drill bit into the other of said openings to guide said bit; and

drilling all the way through the workpiece from said other opening to the pilot hole to extend said hole all the way through the workpiece.

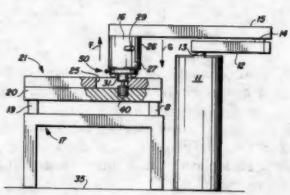
4,601,619
ROUTING APPARATUS

John L. Stinnett, 6401 W. Washington, Phoenix, Ariz. 85043

Filed Oct. 25, 1984, Ser. No. 664,695

Int. Cl.[4] **B23C** *1/06*

U.S. Cl. 409—180 **3 Claims**



1. Apparatus for routing an elongate groove of generally constant depth in a panel of material, said panel including an upper planar surface, said apparatus including, in combination,

(a) a table for supporting in a generally horizontally oriented position said panel of material and a template positioned on top of said panel of material, said template having

(i) top and bottom surfaces each lying in a generally horizontally disposed imaginary plane, and

(ii) at least one opening formed therethrough, said opening including a peripheral edge defining said opening;

(b) a base;

(c) a first generally horizontally oriented elongate substantially rigid support arm having a first end and a second

end, said first end being pivotally connected to said base such that said support arm pivots in a generally horizontal plane;

(d) a second generally horizontally oriented elongate substantially rigid support arm having a rear end pivotally attached to said second end of said first support arm such that said second support arm pivots in a generally horizontal plane and having a forward end carrying a milling head fixedly attached hereto for simultaneous movement with said second arm, said milling head being supported by said second arm at a first normal elevation and having a top portion and a bottom portion and including

(i) a cylindrical member extending downwardly from said bottom portion of said milling head and having an upper end, a lower end and an outer surface circumscribing a generally vertical imaginary axis, said outer surface being forced against and tracking said peripheral edge of said template opening when said apparatus is utilized to rout a groove in said panel of material,

(ii) a cylindrical router bit extending downwardly from said lower end of said cylindrical member, said bit having a longitudinal axis generally corresponding to and lying along said generally vertical imaginary axis,

(iii) means for rotating said router bit,

(iv) a fixed surface generally lying in an imaginary horizontal plane perpendicular to said imaginary vertical axis, said fixed surface circumscribing and extending outwardly from said upper end of said cylindrical member and being provided with template contacting means extending downwardly therefrom, said template contacting means including

collar means having a lower planar surface circumscribing and extending outwardly from said cylindrical member, and

antifriction means carried by said lower surface of said collar means for contacting and moving over said surface of said template,

said antifriction means providing minimal frictional resistance when forced against and moved laterally across said top surface of said template when said apparatus is utilized to rout a groove in said upper planar surface of said panel of material,

(v) handles which can be grasped and pulled and pushed to laterally displace said milling head and first and second elongate support members in an infinite number of directions to position said milling head over selected portions of said top surface of said template to rout said groove in said panel,

a downward force applied to said milling head when said head is only supported above the ground by said second arm causing the downward displacement thereof from said first normal elevation and causing the downward resilient flexure of said second support arm, an upward force applied to said milling head when said head is only supported above the ground by said second arm causing the upward displacement thereof from said first normal elevation and causing the upward resilient flexure of said second support arm, said template being positioned on said table such that each of said selected portions of said top surface of said template

(e) contact said antifriction means of said template contacting means during routing of said grooves, and

(f) support said milling head in one of

(i) said first normal elevation, and

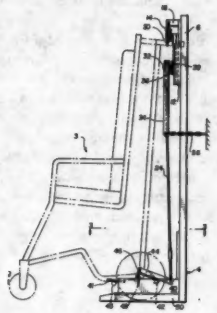
(ii) a second elevation higher than said first normal elevation, said second arm being upwardly resiliently flexed when said milling head is supported in said second elevation by said template.

4,601,620

SECURING APPARATUS

Robert O. Bugger, Rte. 4, Box 184, and Timothy W. Cotter, Rte. 2, Box 208 B, both of Effingham, Ill. 62401

Filed Dec. 28, 1983, Ser. No. 566,228
Int. Cl.[4] B60P *3/06*
U.S. Cl. 410—22 **11 Claims**



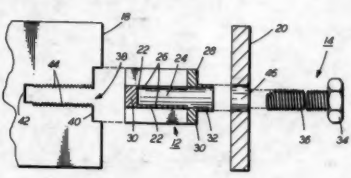
1. Apparatus for securing a wheelchair to an object comprising lower securing means fixed to said object including first projection means spaced from a floor of said object extending in a first direction to engage a portion of said wheel chair which extends in a second direction transverse to said first direction and engagement means for engaging a rear axle of said wheelchair to prevent movement of said chair in said first direction; upper securing means for engaging an upper portion of said wheelchair for preventing movement of said chair in said first direction; and control means for moving said upper and lower securing means into positions to hold said axle and said upper portion.

4,601,621

APPARATUS AND METHOD FOR ANGULARLY CONNECTING TWO PLATES

Ronald L. Permoda, Irondequoit, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 11, 1984, Ser. No. 609,417
Int. Cl.[4] F16B *37/04, 5/02, 9/02*
U.S. Cl. 411—182 **21 Claims**



1. Fastening apparatus for angularly connecting first and second angularly disposed plates,

said fastening apparatus comprising:

holding means adapted to fit into a notch provided in an edge in a first plate member to be fastened to an angularly disposed second plate member, said notch being defined by generally opposing sides extending inwardly from said edge of said first plate member, said holding means including guide means for guiding a fastening means into said notch; opposing slot means adapted for slidable engagement with the opposing sides of said notch, said opposing slot means including channel slot means forming a narrow opening between said guide means and said slot means, and extending therealong; and

fastening means adapted to pass through an opening in said second plate member and through said guide means, said fastening means including gripping means adapted for direct mechanical engagement with said opposing sides of said notch of said first plate member, through said channel slot means.

19. A method of angularly fastening first and second plates with a holding means and fastener means, including the steps of:

providing a notch with opposing edges in a first plate edge;

providing a fastener receiving opening in a second plate;

providing a holding means with slot means for slidably engaging with said notch edges, guide means for receiving a fastener means and channel slot means extending through said holding means from said slot means to said guide means, whereby said notch edges are accessible to said fastener means in said guide means;

slidingly engaging said holding means with said notch edges;

inserting a fastener member through said receiving opening, and through said guide means to engage with said notch edges through said channel slot means.

4,601,622

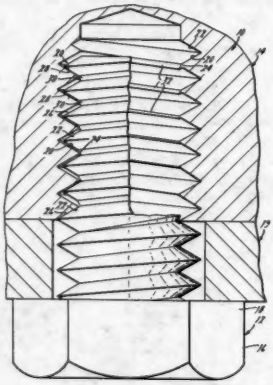
FASTENER

Lyman R. Lyon, Bloomfield Hills, Mich., assignor to Microdot Inc., Darien, Conn.

Filed May 11, 1981, Ser. No. 262,695

Int. Cl.⁴ F16B *39/30*

U.S. Cl. 411—311 **3 Claims**



1. A fastener assembly comprising an internally threaded element having a standard thread of substantially uniform pitch and including top and bottom flanks intersecting to define a thread crest, and an externally threaded element having a depitched thread portion at one end sized so as to be receivable in said internally threaded element, the depitched thread portion of said externally threaded element having top and bottom flanks with a wedge ramp at the root thereof diverging with respect to its central axis in a direction toward the one end thereof, the pitch of said depitched thread portion being less than the pitch of the thread in said internally threaded element whereby the crest thereof exhibits an interference fit with the wedge ramp on the depitched thread portion of said externally threaded element which is maximized at said one end thereof.

4,601,623

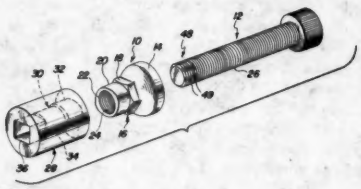
FASTENER SYSTEM AND METHOD

John Wallace, 16521 Le Grand La., Huntington Beach, Calif. 92649

Filed Dec. 6, 1982, Ser. No. 447,319

Int. Cl.⁴ F16B *39/22*

U.S. Cl. 411—336 **8 Claims**



1. A fastener system comprising:

a nut having an axial bore with interior threads;

a bolt having exterior threads for engagement with the interior threads of said nut,

said nut having a head portion having a rotatable camming surface engageable by a driver, said camming surface of said head portion having an out-of-round exterior contour defined by a continuous, smooth curve, a substantial portion of the circumference of said head portion being non-resiliently deformable radially inward upon application of a predetermined torque to said camming surface by said driver as the nut is tightened on the bolt, such that with deformation, the material of the nut is displaced radially inward into the axial bore of the nut for engagement with the bolt to lock said nut and bolt together, the contour of said continuous curve of said camming surface producing smooth deformation of said head portion without shearing.

4,601,624

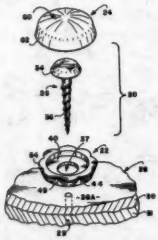
FASTENER HEAD COVER ASSEMBLY

Royce W. Hill, Flippin, Ark., assignor to Ark-Plas Products Inc., Flippin, Ark.

Continuation of Ser. No. 604,538, Apr. 27, 1984, abandoned. This application Nov. 13, 1985, Ser. No. 797,485

Int. Cl.⁴ F16B *37/14*

U.S. Cl. 411—373 **5 Claims**



1. A two piece, resilient plastic head cover assembly for decoratively covering the head of a conventional screw, bolt, or the like installed in or through a workpiece, at least a portion of said workpiece being substantially planar, said assembly comprising:

an anchor member adapted to be secured in operative position by said screw, bolt or the like upon said planar portion of said workpiece, said anchor member comprising:

a planar flange-like base of generally circular cross section having a central orifice defined therein for admitting

said screw or the like therethrough, said base having an outer peripheral edge;

a bottom comprising a flat underside of said base;

an integral peripheral rim rising upwardly from the outer peripheral edge of said base, said rim coaxially surrounding said central orifice, said rim having a top and an external circumferential periphery;

a plurality of radially spaced apart petals integrally formed upon said rim, said petals being generally in the form of an inverted conic section intersecting the periphery of said rim, and each of said petals having an outermost inclined edge; and,

each of said petals comprising a horizontal top coplanar and contiguous with the top portion of said anchor member base rim and oriented substantially parallel with the planar surface of said workpiece when said assembly is installed upon said workpiece; and,

a cup-like, resilient plastic cover plate adapted to be yieldably snap fitted to said anchor member to decoratively cover a head of said screw, fastener or the like, said cover plate comprising:

a generally convex top portion;

a peripheral downwardly projecting rim integral with said top portion, the last mentioned rim having an internal snap-fit groove defined therewithin for receiving said petals, said snap fit groove having a notch-like cross section conformed generally to frictionally contact the outermost inclined edges of each of said petals whereby to secure said cover plate to said base; and,

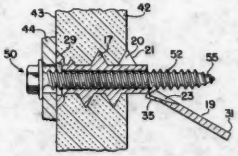
an expansion groove defined interiorly of said cover plate rim in spaced-apart, generally parallel relation with respect to said snap fit groove and separated therefrom by an apex, said expansion groove adapted to expand said cover plate rim and initially slightly compress said petals when said cover plate is forcibly fitted to said anchor member.

4,601,625

SELF DRILLING THREADED INSERT FOR DRYWALL

Richard J. Ernst, Palatine; Francis C. Peterson, St. Charles, and Melissa L. Sledz, Streamwood, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed May 11, 1984, Ser. No. 609,260
Int. Cl.⁴ F16B *25/00*
U.S. Cl. 411—387 **15 Claims**



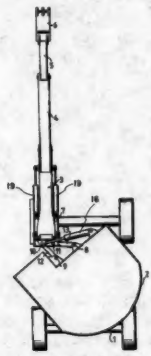
1. An anchor for use in friable material comprising a generally hollow cylindrical body with a flanged end and a driling end, said body having an exterior thread disposed thereon, said drilling end including notch means formed in said drilling end adjacent said body for allowing passage of an elongated fastener through and beyond said drilling end, said notch means creating a section of reduced cross-sectional area in said drilling end to reduce resistance of said drilling end to bending.

4,601,626

ARRANGEMENT FOR SWINGING AN ATTACHMENT HOLDER FOR THE EQUIPMENT OF A HYDRAULIC EXCAVATOR

Franz Heine, and Manfred Kowalewski, both of Dortmund, Fed. Rep. of Germany, assignors to O&K Orenstein and Koppel Aktiengesellschaft, both of Berlin, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 531,126
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234020
Int. Cl.⁴ E02F *3/32*
U.S. Cl. 414—687 **9 Claims**



1. A device for enabling swinging an attachment holder of a hydraulic excavator around an axis perpendicular to a platform plane of an upper carriage of the excavator, in a working direction at a fixed angle relative to a longitudinal direction of a chassis of the excavator, the excavator comprising a boom having a boom lower part upwardly and downwardly swingably fastened to the attachment holder, the device comprising

first means for pivotally mounting the attachment holder to the upper carriage,

second means for pivotally mounting said upper carriage to the chassis for rotation about a vertical axis,

said first means comprises two radial links which are pivotally mounted adjacent each end of said links for turning around a respective vertical axis, one of said vertical axes of each of said two links being spaced from each other on said attachment holder, and the other one of said vertical axes of each of said two links being spaced from each other on said upper carriage, and

an active setting member having spaced apart end portions, one of said spaced apart end portions being directly pivoted to said attachment holder and the other of said spaced apart end portions being directly pivoted to said upper carriage of the excavator.

4,601,627

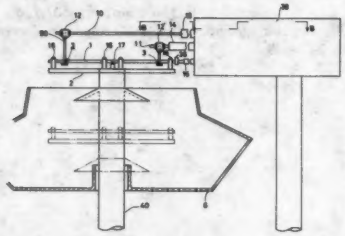
APPARATUS FOR TRANSFERRING THIN SHEET-LIKE ARTICLE SUCH AS WAFERS

Masahiko Oka, and Masami Nishida, both of Hikone, Japan, assignors to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 2, 1984, Ser. No. 585,695
Claims priority, application Japan, Apr. 23, 1983, 58-72009
Int. Cl.⁴ B65H *5/10*
U.S. Cl. 414—225 **11 Claims**

1. An apparatus for transferring thin sheet-like articles, such as wafers, wherein thin sheet-like articles fed in one by one through a transfer passage are transferred and fed to a device for treating said thin sheet-like articles, said apparatus comprising: opposed pairs of contact elements,

wherein said contact elements each comprise a vertically depending bar having attached to its lower end a truncated cone having a bevelled surface whereby the outer edge of said sheet-like article is supported by the outer perifery of said bar and the bevelled surface of said cone, and



means for adjusting the distance between said opposed pairs of contact elements, said adjusting means including a pair of moving rods reciprocating in parallel in opposite directions to each other, said opposed pair of contact elements being carried by one end of each of said moving rods.

4,601,628

STORAGE STRUCTURES

Michael M. Lowing, 89 Lower West Burleigh Road, Burleigh Heads, Queensland, 4220, Australia

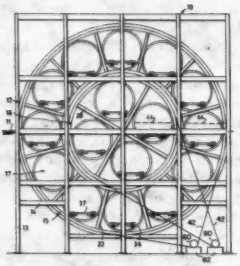
PCT No. PCT/AU84/00010, § 371 Date Sep. 14, 1984, § 102(e) Date Sep. 14, 1984, PCT Pub. No. WO84/02895, PCT Pub. Date Aug. 2, 1984

PCT Filed Jan. 17, 1984, Ser. No. 653,228

Claims priority, application Australia, Jan. 17, 1983, PF7640; May 31, 1983, PF9617

Int. Cl.[4] E04H *6/16*

U.S. Cl. 414—250 **6 Claims**



1. In a rotary parking structure for vehicles the improvement comprising:

(a) a free standing support frame having a plurality of spaced vertical uprights defining two opposing sides, the uprights in each said opposing side being interconnected by cross-beams, said uprights including mounting faces;

(b) a first pair of circular support tracks, and means for rigidly securing said first pair of tracks to said vertical uprights at both sides of the structure, said securing means being in abutting engagement with the adjacent faces of the uprights;

(c) an independent rotatable outer subframe which includes a pair of outer rings, a separate outer ring concentric with a separate first support track, said outer rings defining tracks in opposing spaced relationship with said first support tracks, and

a pair of inner rings, a separate inner ring concentric with a separate outer ring and first support track, said inner rings defining tracks;

(d) a second pair of circular support tracks concentric with said first support tracks, each of said second support tracks having inner and outer track members, and means for securing said second support tracks to the uprights of said support frame, and securing means being in abutting engagement with the adjacent faces of the urights, the outer track member of each said second support track being in opposing spaced relationship with the track of a separate said inner ring;

(e) an independent rotatable inner subframe concentric with and having a smaller diameter than said outer subframe and which includes a pair of rings, a separate inner subframe ring concentric with a separate second circular support track, said inner subframe rings defining tracks in opposing spaced relationship with the inner track members of said second support tracks;

(f) bearing rollers mounted between said spaced opposing tracks for permitting rolling movement of said inner and outer subframes relative to said first and second circular support tracks, and thus said support frame, said rollers being mounted between said spaced opposing tracks without fixed bearing means so as to transfer the weight of said subframes and the vehicles parked in said parking structure directly to said first and second circular support tracks, and thereby to said support frame to which said support tracks are secured;

(g) means for independently rotating said first and second subframes to bring each, independently, to a loading or unloading position;

(h) a series of spaced, substantially cylindrical storage frames defining storage zones and positioned within said first and second subframes for rotation therewith; and

(i) vehicle-supporting platform means freely positioned in each storage frame for rotation therewith and movement relative thereto, the free positioning permitting said support platform means to remain horizontal during rotation of the subframe in which it is positioned so as to horizontally support the vehicles at all times.

4,601,629

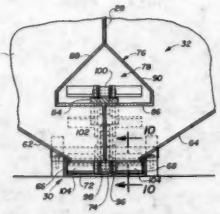
FINE AND COARSE AGGREGATES CONVEYING APPARATUS

Harold M. Zimmerman, R.D. 1, Wabash Rd., Ephrata, Pa. 17522

Filed Jun. 20, 1984, Ser. No. 622,380

Int. Cl.[4] B65G *65/42*

U.S. Cl. 414—327 **5 Claims**



1. In a concrete production system having a longitudinal tank for storing aggregates and a longitudinal bottom trough for receiving said aggregates therefrom, said trough being open at its top in communication with said tank and having a discharge end, improved aggregates conveying apparatus which comprises:

(a) said tank being composed of a pair of side-by-side, longitudinal hoppers for respectively storing fine and coarse aggregates;

(b) said trough being disposed in common to both of said hoppers for receiving said respective aggregates therefrom, said trough having a generally horizontal bottom floor and a pair of laterally spaced generally upright sides which at their upper edges define said open top thereof and at their lower edges are interconnected by said bottom floor, said spaced sides and bottom floor of said trough defining a space generally rectangular in cross-section into which aggregates from said respective hoppers of said tank can flow only through said open tank of said trough;

(c) a continuous conveyor mounted for movement along said trough, said conveyor having a lower aggregate conveying run disposed in said space defined by said spaced sides and bottom floor of said trough and in slidable engagement within said trough, said conveyor having a width and height adapted to substantially match said sides and bottom floor of said trough and fill said trough such that its open top overlies said conveyor, said conveyor for dragging aggregates, received from said hoppers of said tank into said trough, onto its bottom floor and only through its open top overlying said conveyor, toward said trough discharge end without allowing any stationary build-up of aggregates within said trough and an upper return run disposed above said trough and said lower run of said conveyor; and

(d) a longitudinal wall structure extending through said tank between said hoppers thereof and defining a chamber isolated from said aggregates stored in said respective hoppers of said tank which provides a passageway for said upper return run of said conveyor, said longitudinal wall structure including

(i) a tubular wall portion spaced above said open top of said trough for allowing passage of aggregates from said hoppers of said tank into said trough open top, said tubular wall portion defining said chamber which provides said passageway for said upper return run of said conveyor, and

(ii) a lower longitudinal generally vertical wall portion attached to and extending below said tubular wall portion and between said hoppers of said tank, said wall portion having a lower edge disposed generally at the level of said open top of said trough and aligned above said lower run of said conveyor so as to keep said lower conveyor run from rising up over aggregates received and being conveyed in said trough.

4,601,630

LOAD HANDLING APPARATUS

Edward S. Kress; Dennis R. Thomas, and William L. LaBerdia, all of Brimfield, Ill., assignors to Kress Corporation, Brimfield, Ill.

Continuation-in-part of Ser. No. 428,751, Sep. 30, 1982, Pat. No. 4,488,848. This application Aug. 29, 1984, Ser. No. 645,910

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.⁴ B60P *3/00*

U.S. Cl. 414—460 **4 Claims**

1. A load handling apparatus comprising, in combination,

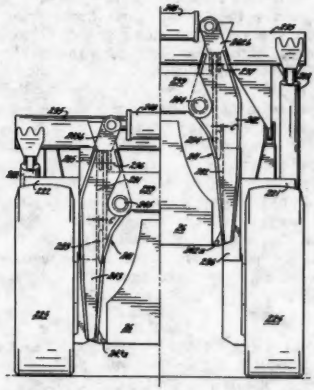
a main frame having a pair of main support beams arranged substantially parallel and spaced apart from one another by an amount sufficient to straddle the load to be handled;

a lift frame spanning the space between the main support beams, the lift frame having two side members and a single cross member, each side member being pivotally mounted at one end to the main support beams at a first set of transversely aligned pivot points, and each said side member being rigidly connected at the other end to the cross member, the lift frame being movable between a lowered position in which portions of the lift frame including the cross member may rest on the main support beams and a raised position in which the portions of the lift frame are pivoted up and away from the main support beams, the difference in elevation of the lift frame portions relative to the main frame between raised and lowered positions providing the lifting capability of the lift frame;

a tong subassembly supported from the cross member at a second set of transversely aligned pivot points, the second set of pivot points being longitudinally spaced from the first set of pivot points;

means for actuating said lift frame to raise and lower the tong subassembly relative to the main frame;

means for actuating the tong subassembly for clamping onto the load; and



a load stabilizing link, the opposite ends of the link being pivotally connected between the main frame and the tong subassembly at longitudinally spaced pivot points, the first and second sets of pivot points and the pivot points of the ends of the load stabilizing link forming substantially a parallelogram when viewed from the side whereby the tong subassembly mechanism is maintained in substantially the same orientation relative to the ground as the lift frame is raised and lowered; and

means for limiting lateral movement of the lift frame and tong subassembly relative to the main frame.

4,601,631

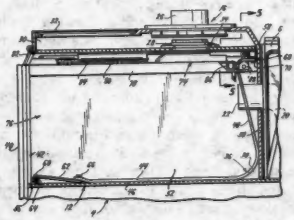
UNLOADING SYSTEM FOR STREET SWEEPER

K. W. M. Van Raaij, 1800 AG Alkmaar, Netherlands

Filed Feb. 10, 1984, Ser. No. 579,162

Int. Cl.⁴ B60P *1/36*

U.S. Cl. 414—509 **1 Claim**



1. An unloading system for discharging debris from a hopper wherein the hopper has substantially parallel side walls, a front wall, a rear wall and a floor, means to open the rear wall to allow discharge of the debris, a sheet-like member extending over substantially the entire span between the side walls of the hopper, the sheet-like member having a forward edge and a rearward edge, the forward edge being connected to the

hopper adjacent the top of the front wall, the rearward edge being connected to the hopper adjacent the intersection between the floor and the rear wall, a carriage comprising a rigid beam extending transversely of the hopper between the side walls adjacent the tops thereof, a roller parallel to and supported by the beam adjacent the lateral ends thereof, a longitudinally extending hydraulic actuator having a piston and cylinder one of which is connected to the center of the beam and the other of which is connected to the hopper so that operation of the hydraulic actuator in a first direction moves the carriage rearwardly and operation of the hydraulic actuator in a second direction moves the carriage forwardly, the sheet-like member extending across the top and rear surfaces of the roller and having a first portion extending generally horizontally from the front edge of the sheet-like member to the roller, a second portion hanging generally vertically from the roller to the floor, and a third portion extending across the floor from the second portion to the rearward edge of the sheet-like member, whereby movement of the carriage rearwardly of the hopper progressively increases the length of the first portion and progressively decreases the length of the third portion thereby transferring the second portion toward the rear of the hopper to expel debris therefrom, the roller being forward of the beam, a scraper supported by the carriage on the rearward side of the roller, the scraper extending laterally to engage the surface of the sheet-like member and scrape debris therefrom during rearward movement of the carriage.

4,601,632

STOWABLE TRUCK RAMP WITH EXTENSION SLEEVE

John H. Agee, R.R. 2, Fremont, Nebr. 68025

Filed Dec. 10, 1984, Ser. No. 679,988
Int. Cl.[4] B65G *67/02*
U.S. Cl. 414—537 **5 Claims**

1. A stowable ramp assembly for a pickup truck or the like having an elongated bed and a tailgate pivotally movable between vertical and horizontal positions, comprising,

a generally thin, flat and elongated ramp sleeve having forward and rearward ends, a load supporting top wall and a pair of opposite side walls, said ramp sleeve adapted for placement on a truck bed with the rearward end thereof positioned at the rearward end of the bed,

an extension sleeve generally telescopically slidably received in said ramp sleeve for fore and aft sliding movement between a storage position at least substantially within said ramp sleeve and a working position extended rearwardly of the ramp sleeve by a dimension of approximately the rearward extent of the tailgate from the bed in the horizontal position thereof,

said ramp sleeve and said extension sleeve each comprising an inverted generally U-shaped channel member,

first coacting stop means on said ramp sleeve and extension sleeve operative to limit rearward sliding movement of the extension sleeve to the working position thereof, said first coacting stop means comprising an outward rod-like projection on each side wall of the extension sleeve adjacent the forward end thereof and a pair of registered stop plates on the interior surface of the ramp sleeve side walls adjacent the rearward ends thereof and at positions for abutment by said rod-like projections,

an elongated ramp generally telescopically slidably received in said extension sleeve for fore and aft sliding movement through said extension sleeve and into and from said ramp sleeve between a storage position substantially entirely within said ramp sleeve and an extended working position with the forward end of the ramp situated adjacent the rearward end of the extension sleeve in the working position thereof,

said ramp substantially as long as said ramp sleeve,

second coacting stop means on said ramp and extension sleeve operative to limit rearward sliding movement of the ramp to the working position thereof, said second coacting stop means comprising an outward rod-like projection on each side wall of the ramp adjacent the forward end thereof and a pair of registered stop plates on the interior surface of the extension sleeve side walls adjacent the rearward ends thereof and at positions for abutment by said rod-like projections on the ramp, and

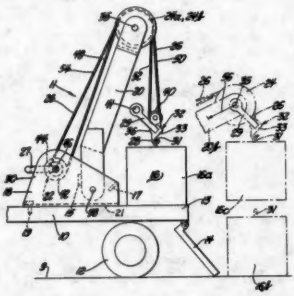
the forward end of said ramp, in the extended working position thereof, being connected to said extension sleeve for up and down pivotal movement of the rearward end of the ramp.

4,601,633

HOIST

Erwin F'Geppert, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 7, 1984, Ser. No. 679,432
Int. Cl.[4] B60P *1/54*
U.S. Cl. 414—546 **1 Claim**



1. A hoist mountable on the bed of a cargo vehicle for transferring a load between ground level and the bed: said hoist comprising a support frame (**18**) anchored to the bed in a location spaced from an edge (**13**) of the bed, whereby the bed area between the support frame and bed edge is adapted to receive a load; a winding drum (**22**) rotatably supported in the frame remote from the aforementioned edge of the bed; an elongated non-extensible boom (**20**) having an inner end and an outer end, means (**38**) swingably connecting the inner end of the boom to the support frame, whereby the boom can move between a generally upright position extending upwardly from the bed and a generally prone position projecting laterally beyond the aforementioned bed edge; stop means (**15,17**) carried by the frame for limiting the boom to motion between its upright and prone positions; pulley means (**24*a*, 24*b***) at the outer end of the boom, said pulley means being mounted for rotation on a horizontal axis with a projecting axial portion; a load-suspension means (**32**) designed to operate in the space below the pulley means; cable means trained around the winding drum, over the pulley means, and thence down to the load-suspension means; and disengageable latch means (**29**) having a swingable ear structure with an opening therein carried by the load-suspension means for temporary attachment of the opening to the projecting portion on the outer end of the boom when the load-suspension means is in near-adjacency to the pulley means; the boom swing axis being closer to the aforementioned edge of the bed than the winding drum axis so that when the boom is moving from its upright position to its

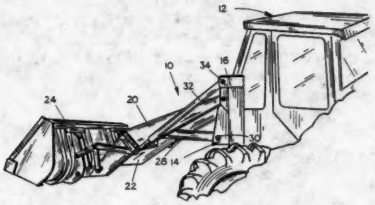
prone position the spacing between the winding drum axis and the pulley means axis increases; said boom being dimensioned so that when it is in its prone position it can be latched to the load-suspension means, whereby subsequent rotation of the winding drum in a first direction causes the boom to swing upwardly to its upright position for laterally transporting the suspended load to a position above the vehicle bed, after which the load-suspension means can be unlatched from the boom to permit the load to be lowered onto the bed by rotation of the winding drum in a second direction; the support frame constituting the sole support mechanism for the boom and winding drum.

4,601,634

CYLINDER STRAIN RELIEF LINKAGE FOR A LOADER DEVICE FOR A TRACTOR OR THE LIKE

Joseph W. Langenfeld, and Neal W. Westendorf, both of Onawa, Iowa, assignors to Westendorf Manufacturing Company, Inc., Onawa, Iowa

Filed Sep. 6, 1985, Ser. No. 773,014
Int. Cl.[4] E02F *3/36*
U.S. Cl. 414—697 **5 Claims**



1. A loader device for a tractor or the like, comprising,

a frame means adapted to be secured to the tractor,

said frame means including first and second, spaced-apart uprights having upper and lower ends,

first and second boom arms, having rearward and forward ends and inner and outer sides, secured at their rearward ends to said first and second uprights respectively below the upper ends thereof,

first and second hydraulic cylinders pivotally secured at one end to said first and second uprights respectively adjacent the lower ends thereof, and pivotally secured at their other ends to the inner sides of said first and second boom arms respectively intermediate the ends thereof,

a loader bucket pivotally secured to the forward ends of said boom arms and being movable between a dumping position and a tipped-back position,

third and fourth hydraulic cylinders pivotally connected at one end to said first and second uprights respectively adjacent the upper ends thereof and extending forwardly therefrom,

and first and second linkage means pivotally connecting said third and fourth hydraulic cylinders to said loader bucket for moving said loader bucket between its said dumping position and tipped-back position,

said first linkage means comprising a first pivot pin secured to said first boom arm intermediate the ends thereof and extending horizontally outwardly therefrom, a first link means, having opposite ends, pivotally secured at one end to said first pivot pin, a second link means, having opposite ends, pivotally secured at one end to the other end of said first link means, said other end of said third hydraulic cylinder being pivotally connected to the pivotal connection of said first and second link means, a third link means, having opposite ends, pivotally secured at one end to the other end of said second link means and pivotally secured at its other end to said loader bucket above and outwardly of the pivotal connection of said first boom arm and said loader bucket, a second pivot pin secured to said first boom arm rearwardly of but adjacent the forward end thereof and extending horizontally outwardly therefrom, a fourth link means, having opposite ends, pivotally secured at one end to the pivotal connection of said second and third link means and pivotally connected at its other end to said second pivot pin,

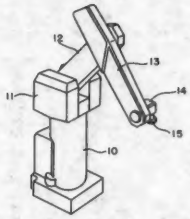
said second linkage means being identical to said first linkage means but being positioned outwardly of the outer side of said second boom arm.

4,601,635

MULTILINK-TYPE ROBOT

Teruyuki Ito, Nagoya, and Osamu Toyama, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 3, 1983, Ser. No. 491,172
Claims priority, application Japan, May 14, 1982, 57-82135
Int. Cl.[4] B66C *1/00*
U.S. Cl. 414—730 **2 Claims**



1. A multilink-type robot, comprising:

a base;

an arm support pivotably mounted on said base for angular movement about a vertical axis and having a pair of side support ledges, said support ledges extending upwardly with a U-shaped recess defined therebetween and extending through substantially the entire length of said arm support;

a first shaft extending across said recess and having opposite ends rotatably supported on said support ledges;

a second shaft rotatably supported on said arm support in coaxial relation to said first shaft for relative rotation with respect to said first shaft;

a first arm having one end fixed to said first shaft;

a third shaft rotatably supported on an opposite end of said first arm in parallel relation to said first shaft;

first rotation transmission means for transmitting rotation of said second shaft to said third shaft;

a second arm having one end fixed to said third shaft;

a fourth shaft rotatably supported on an opposite end of said second arm in parallel relation to said third shaft;

a wrist unit fixed to said fourth shaft; and

first and second arm driving means including first and second servomotors for driving said first and second shafts, respectively, said first and second servomotors having respective output shafts extending in parallel relation to said first shaft, but in mutually opposite directions, and being positioned downwardly of a bottom portion of said recess in said arm support so that said first arm is rotatable through a half revolution between first and second horizontal positions opposed diametrically of said first shaft;

wherein said wrist unit further comprises a wrist body fixed to said fourth shaft, a twist shaft supported on said wrist body for rotation about an axis normal to an axis of said fourth shaft and having a tool attachment on one end, and a twist shaft drive unit for rotating said twist shaft with respect to said wrist body; and

wherein said twist shaft drive unit further comprises a drive shaft extending longitudinally in said second arm and rotatably supported thereon, a fifth shaft rotatably supported on

said fourth shaft and said second arm in coaxial relation to said fourth shaft, a first pair of bevel gears interconnecting said drive shaft and said fifth shaft for gauged rotation thereof, a second pair of bevel gears interconnecting said fifth shaft and said twist shaft for gauged rotation thereof, and a third servomotor mounted on said second arm and coupled to said drive shaft for rotating said drive shaft.

4,601,636

MECHANICAL CARRIER

José P. Daguano, Alameda Guaramomis, 929 - apt. 11, Sao Paulo, Brazil (04076)

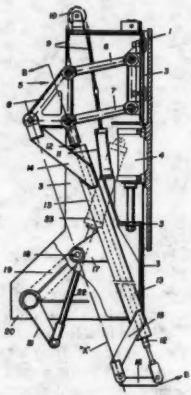
PCT No. PCT/BR83/00005, § 371 Date Jul. 6, 1984, § 102(e) Date Jul. 6, 1984, PCT Pub. No. WO84/02120, PCT Pub. Date Jun. 7, 1984

PCT Filed Jun. 14, 1983, Ser. No. 629,730

Claims priority, application Brazil, Nov. 22, 1982, 8206737

Int. Cl.⁴ B66C *1/00*

U.S. Cl. 414—733 **2 Claims**



1. Mechanical carrier, comprising a chassis/base (1) in vertical position, responsible for the fastening of the set to the machine or equipment wherein it shall be used, said chassis featuring side guides (2), in which a movable body is vertically moved (3), in internal position, driven by a pneumatic cylinder (4), the body of which is fixed in paralel to the internal face of the chassis/base (1), the upper part of said movable body (3) having a first linkage means (5), comprising a pair of cross arms, paralel to each other, one of them in upper position (6) and the other one in lower position (7), both of them with one of their ends jointly mounted to the movable body (3), while the opposite ends thereof are also jointly fixed to a triangular part (8), the upper vertex of which has also fixed the end of a chain (9), which, in turn, develops upwards, so as to meet a gear (10) mounted at the upper part of the movable body (3), after which it develops downward so as to have the end coupled to the piston of a cylinder (11), conveniently fastened to the movable body (3); in one of the lower vertexes of the triangular part (8), or more precisely, at its straight angle vertex, there is jointly fixed the upper end of a cylindrical stem (12), together with the corresponding end of the lower arm (7), developing downward and within a tubular jacket (13), the positioning of which is determined by an upper support (14) and a lower support (15), said upper support (14) having an end fixed to the corresponding end of the jacket (13), while its other end is jointly fixed to the free vertex of the triangular part (8), while the lower support (15) is geometrically fixed in a way that its free end can be jointly interconnected to the lower end of the stem (12), by means of a horizontal part (16), and also in a way that the jointed ends of said supports (14) and (15) stay on a center line (A) paralel to the longitudinal center line (B) of the tubular jacket (13), said paralel condition to be maintained under any circumstance; a bearing (17) comes out from the medium part of the tubular jacket (13), at the free end of which there is a cross axle (18), orthogonally centered on the line (A), the free ends of which having jointly coupled the upper ends of the side arms (19), the lower ends of which being fixed to axles revolvingly mounted to the side parts (20) of the movable body (3), wherein one of said axles is extended outward enough to receive a last radial arm (21), at the free end of which the terminal of a piston (22) of a pneumatic piston (23) is coupled, said pneumatic piston being conveniently mounted at the outer part of the movable chassis (3).

4,601,637

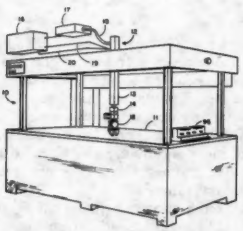
MANIPULATOR GRIPPER TOOL CHANGING APPARATUS

Henry E. Aviles, Tucson, Ariz., and Jane A. Gregory, Boynton Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1984, Ser. No. 565,444

Int. Cl.⁴ B25B *1/24*

U.S. Cl. 414—739 **13 Claims**



1. Automatic gripper finger tool changing apparatus for a multi-axis manipulator of the type having control means for effecting the change of the gripper finger tool on facing surfaces of the gripper comprising:

a dovetail shaped rail attached to and located lengthwise along said facing surfaces of the gripper;

each of said gripper finger tools having a complementary dovetail shaped opening formed lengthwise therein, said opening being of a size to prevent said dovetail shaped rail from moving in any direction except lengthwise when inserted therein;

said control means associated with said manipulator providing movement of said gripper to cause said dovetail shaped rail to slide lengthwise into said dovetail shaped opening;

locking means for locking said dovetail shaped rail in said dovetail shaped opening in said gripper finger tool;

a tool holder located in the work space of said manipulator for holding said gripper finger tools when not attached to said gripper fingers and where said finger tools are picked up and deposited under control of said control means;

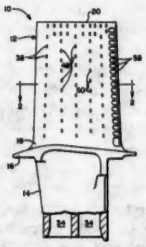
unlocking means located on said tool holder for automatically unlocking said dovetail shaped rail from said finger tool so that said manipulator can remove said dovetail shaped rail from said dovetail shaped opening.

4,601,638

AIRFOIL TRAILING EDGE COOLING ARRANGEMENT

Edward C. Hill, Tequesta; George P. Liang, Palm City, and Thomas Auxier, Lake Park, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1984, Ser. No. 685,263
Int. Cl.[4] F01D 5/18
U.S. Cl. 416—97 R 8 Claims



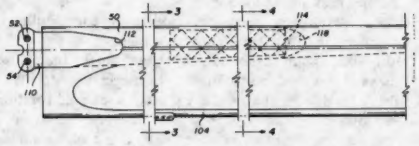
1. An airfoil including a pressure side wall having a spanwise extending downstream edge of thickness t, and a suction side wall, said suction side wall defining the trailing edge of said airfoil, said trailing edge having a thickness d, a spanwise cooling air cavity defined between said pressure and suction side walls, said airfoil including a trailing edge region downstream of said cavity, said downstream edge of said pressure side wall being spaced a distance x upstream of said trailing edge exposing a back surface of said suction side wall downstream thereof, said pressure and suction side walls spaced apart defining a spanwise extending slot therebetween in said trailing edge region in fluid communication with said cavity, a plurality of longitudinally spaced apart, downstream extending partitions disposed within said slot and dividing said slot into a plurality of channels, each channel having an inlet for receiving cooling air from said cavity and an outlet of width s, measured in a plane perpendicular to the spanwise direction, at said pressure side wall downstream edge for discharging cooling air from said airfoil, each channel having a throat at its inlet of width A, measured in a plane perpendicular to the spanwise direction, A being less than s, wherein the ratio t/s is less than or equal to 0.7, x is at least 0.100 inch, d is no greater than 0.040 inch, and the thickness of the suction side wall at the channel outlets is less than the thickness d of the trailing edge.

4,601,639

NODALIZED ROTOR

Jing G. Yen, Arlington, and David A. Popelka, Bedford, both of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.

Filed Mar. 19, 1984, Ser. No. 590,987
Int. Cl.[4] B64C 27/46
U.S. Cl. 416—230 10 Claims



1. A nodalized rotor system for a four bladed helicopter comprising:

(a) a hub having equally spaced radial arms;

(b) a blade coupled each of said arms, each said blade having:

i. a concentration of mass from about 32% to 42% of the hub-blade combination radius of running weight per unit length four times the running weight per unit length at 50% of the hub-blade combination radius;

ii. reduced mass in the outboard 30% of the blade of running weight per unit length about 80% of the running weight per unit length at 50% radius; and

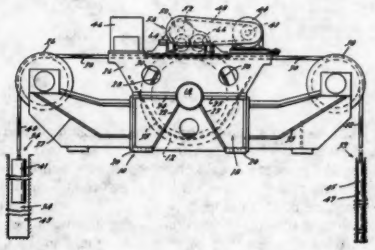
iii. beam-wise and chord-wise stiffness of the hub region are approximately four times the stiffness at 50% blade radius with the hub running weight per unit length approximately the same as the blade running weight at 50% radius.

4,601,640

OIL WELL PUMP

Gordon M. Sommer, 2324 Date Palm Rd., Boca Raton, Fla. 33432

Continuation-in-part of Ser. No. 327,717, Dec. 4, 1981, abandoned. This application Apr. 2, 1984, Ser. No. 596,055
Int. Cl.[4] F04B 49/00, 35/04; F16H 3/14
U.S. Cl. 417—12 15 Claims



1. An oil well pump assembly including means for pumping oil from an oil well through a well hole, comprising a pumping rod and means for reciprocating said pumping rod in said well hole, counterbalance means for reducing the power needed to pump said oil, motor means, means for driving said reciprocating means, and means for driving said counterbalance means, the improvement comprising:

means for engaging said motor means alternately with said reciprocating driving means and said counterbalance driving means comprising

oil shear clutch means operably associated with said reciprocating means, driving means to raise said reciprocating means, and

oil shear clutch means operably associated with said counterbalance means, driving means to raise said counterbalance means; and

dwell means for stopping both said reciprocating means and said counterbalance means in a selected position for a selected amount of time comprising oil shear brake means.

4,601,641

DISCHARGE PRESSURE-DEPENDANT VARIABLE-CAPACITY RADIAL PLUNGER PUMP

Masatoshi Kuroyanagi; Masahiko Suzuki, and Hiroshi Iwata, all of Aichi, Japan, assignors to Nippondenso Co. Ltd., Kariya, Japan

Filed Jul. 24, 1985, Ser. No. 758,383
Claims priority, application Japan, Jul. 24, 1984, 59-154296
Int. Cl.[4] F04B 49/06, 49/08
U.S. Cl. 417—220 3 Claims

1. A variable-capacity radial plunger pump comprising:

a housing having a cavity with an inner peripheral surface providing a rotor chamber;

a rotor rotatably mounted in said rotor chamber of said housing;

said rotor having a plurality of cylinders radially provided therein;

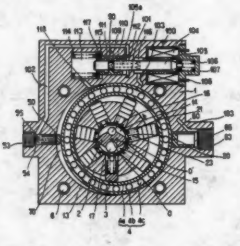
a respective plurality of plungers slidably received in respective ones of said cylinders so that each said plunger has an outer end;

a guide ring means provided between said outer ends of said plungers and said inner peripheral surface of said housing cavity;

said guide ring means having a geometric center which is eccentric in relation to the geometric center of said rotor;

a controlling piston facing said guide ring means for controlling the amount of eccentricity of said guide ring means;

a pilot valve having a sleeve provided in a fluid path which connects means defining a chamber formed behind said controlling piston and a discharge port;



a shaft member slidably connected with said sleeve;

said pilot valve being constructed and arranged for switching the pressure in said chamber formed behind said controlling piston between a low pressure and the discharge pressure of said pump;

an electrically powered controlling means arranged for moving the position of said shaft member in order to control the relationship between said shaft member and said sleeve for changing a critical point at which said pilot valve switches the pressure in said chamber formed behind said controlling piston.

4,601,642

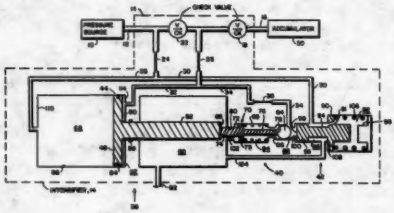
HYDRAULIC PRESSURE INTENSIFIER

Robert S. Andrews, St. Peters, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 1, 1985, Ser. No. 782,630

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—225 **4 Claims**



1. A pressure intensifier, said intensifier having input a fluid at a given pressure from a pressure source and outputting a fluid at a boosted pressure to an accumulator, said accumulator reaching therein a predesignated pressure before said intensifier ceases operation, said intensifier comprising:

a first check valve, said first check valve having an input line and an output line, said input line receiving pressurized fluid from said pressure source;

a second check valve, said second check valve having an input line for receiving pressurized fluid from said output line of said first check valve, said second check valve outputting pressurized fluid to said accumulator from an output line of said second check valve;

a first restrictor, said first restrictor connected to said first check valve input line and outputting pressurized fluid in a first branch line and a second branch line of said first restrictor;

a second restrictor, said second restrictor connected to said output line of said first check valve of said intensifier and connected to a first branch line and a second branch line of said second restrictor, said second restrictor being connected to said input line of said second check valve;

a piston driver, said piston driver connected to said first branch line of said first restrictor and to said first branch line of said second restrictor, said piston driver repeatedly outputting said boosted pressure until said predesignated pressure is achieved in said accumulator;

a pilot valve, said pilot valve in periodic contact with an extension of said piston driver for opening and closing said pilot valve, said pilot valve connected to said second branch line of said second restrictor and having a pilot return line connected to a vent line; and

a dump valve, said dump valve connected to said second branch line of said first restrictor, said dump valve having a dump return line connected to said vent line, and said dump valve in fluid communication with said pilot valve.

4,601,643

ROTARY COMPRESSOR MACHINES

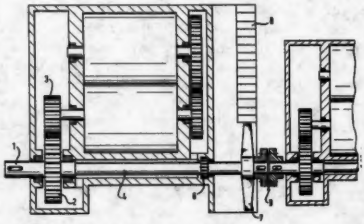
Günter Seidel, Hameln, Fed. Rep. of Germany, assignor to Aerzener Maschinenfabrik GmbH, Aerzen, Fed. Rep. of Germany

Filed Jan. 25, 1983, Ser. No. 460,869

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202993

Int. Cl.[4] F04B *1/20*; F16H *37/06*; F04C *11/00*

U.S. Cl. 417—247 **17 Claims**



1. A rotary compressor machine comprising:

(a) housing means;

(b) rotary compressor means enclosed in said housing means;

(c) an auxiliary shaft enclosed in said housing means and having first and second ends;

(d) gear means disposed within said housing for coupling the auxiliary shaft to said compressor means;

(e) input coupling means which extend out of the housing means for coupling the first end of the auxiliary shaft to a drive for driving the auxiliary shaft at a selected rotational speed; and

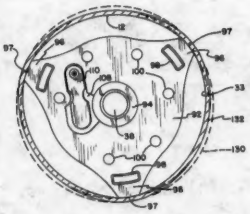
(f) output coupling means which extend out of the housing means for coupling the second end of said auxiliary shaft to input coupling means of a further machine to drive such further input coupling means at such selected rotational speed wherein said further machine comprises a rotary compressor with the same structure as the first mentioned machine.

4,601,644

MAIN BEARING FOR A ROTARY COMPRESSOR

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 13, 1984, Ser. No. 670,309
Int. Cl.[4] F04B 17/00
U.S. Cl. 417—363 12 Claims



10. A hermetic rotary compressor comprising:

a resilient housing;

a motor having a stator and a rotor, said stator being secured to an inside wall of said housing;

a crankshaft driven by said rotor, said crankshaft having an eccentric portion thereon;

bearing means for rotatably supporting said crankshaft, said bearing means secured to said resilient housing at only three points spaced circumferentially equidistantly around said housing, said bearing means being in compression against said housing whereby said housing functions as a compression spring member and the sole resilient means for supporting said bearing means; and

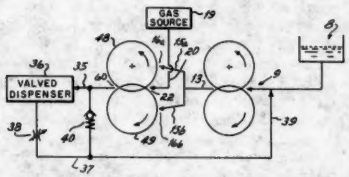
a compression cylinder secured to said bearing means and including a bore, said bore having operably disposed therein a vane and a roller for compressing a refrigerant fluid in said bore, said roller connected to said eccentric portion for rotation therewith.

4,601,645

GEAR PUMP-LIQUID GAS MIXER WITH IMPROVED GAS INTRODUCTION

James W. Schmitkons, Lorain, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Feb. 4, 1985, Ser. No. 697,853
Int. Cl.[4] F01C 1/18, 11/00; B01F 5/14
U.S. Cl. 418—9 4 Claims



1. A two stage gear pump wherein liquid is introduced into a first stage of the pump, metered from the first stage of the pump into the second stage of the pump, intermixed with a gas in the second stage of the pump, and delivered as a mixture to the pump outlet,

each of said first and second stages of said pump having a pumping chamber, a pair of meshing gears rotatably mounted in said pumping chamber, gear teeth on said gears interengaged in a meshing zone of said chamber, and an inlet port adjacent one end of said meshing zone and an outlet port adjacent the other end of said meshing zone,

means for supplying liquid to said inlet port of said first stage pump,

means for transporting a metered flow of liquid from said first stage pump outlet to said second stage of said pump,

means for supplying gas to said second stage of said pump, and

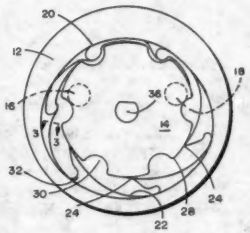
the improvement wherein said gas is supplied to said inlet port of said second stage pump and the means for transporting a metered flow of liquid from said first stage of said pump to said second stage of said pump delivers said liquid to a pair of liquid inlet ports spaced downstream from said gas inlet port.

4,601,646

CENTRIFUGAL POSITIVE DISPLACEMENT DEVICE

John E. Durand, 27441 Ganso, Mission Viejo, Calif. 92691

Filed Sep. 26, 1983, Ser. No. 536,612
Int. Cl.[4] F04C 5/00
U.S. Cl. 418—153 4 Claims



1. A self priming centrifugal positive displacement device comprising: a casing having interior surfaces defining a suction port, a discharge port and a generally cylindrical impeller chamber which chamber is mostly axially symmetric and disposed about an axis having a radial surface axially symmetric between the suction port and discharge port in a selected direction of rotation, the radial surface defining a cylindrical cam of smaller radii than the rest of the chamber between the discharge port and the suction port;

a generally axially symmetric impeller having loop like peripheral fluid drive means which are rigid when rotated between the suction port and the discharge port and flex when rotated between the discharge port and the suction port and utilize fluid coming in the suction port and entering each loop like peripheral fluid drive means and centripetal force to give them their substantial rigidity whereby the impeller acts as a positive displacement impeller between the suction port and the discharge port and utilize the cam and lack of fluid between the discharge port and the suction port to cause the peripheral fluid drive means to flex between the discharge port and suction port;

the peripheral fluid drive means being sufficiently long so as to trail each coupling point where each peripheral fluid drive means is coupled to the generally axially symmetric impeller in form and length as determined by the resultant force lines of centripetal force and fluid resistance forces;

power means; and

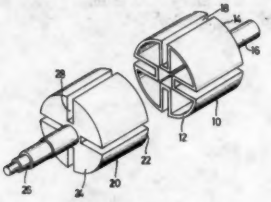
power transmission means coupled from the power means to selectively rotate the impeller.

4,601,647

HOLLOW ROTOR FOR MOVABLE VANE PUMPS AND THE LIKE AND METHOD OF MAKING THE SAME

Hiroshi Sakamaki, Tochigi; Susumu Sugishita, and Yukio Horikoshi, both of Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,186
Claims priority, application Japan, Jan. 18, 1983, 58-5324
Int. Cl.[4] F04C *2/00, 18/00*
U.S. Cl. 418—259 7 Claims



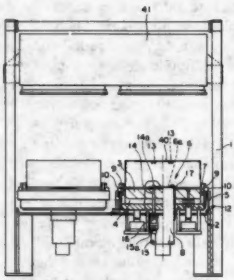
1. A hollow rotor for movable vane compressors and the like comprising a pair of right and left cup-shaped bodies having opposing open side faces and closed side faces, said open, opposing side faces thereof being annularly bonded to each other by a butt weld and right and left shaft members axially and outwardly projecting from the respective closed side faces of said right and left cup-shaped bodies, said cup-shaped bodies defining a closed chamber uninterrupted by said right and left shaft members.

4,601,648

MOLD CLAMP MECHANISM FOR TIRE PRESS

Itaru Amano; Masanobu Kurumaji; Shikao Misumi, all of Kobe; Yasuhiko Fujieda, Akashi, and Masahide Kanzawa, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 9, 1985, Ser. No. 773,549
Int. Cl.[4] B29H *5/02*
U.S. Cl. 425—47 7 Claims



1. A mold clamp mechanism for a tire press, said clamp mechanism comprising:

a frame;

a base connected to said frame;

upper and lower molds mounted on said frame and said base, respectively, wherein said lower mold includes a plurality of rod locking holes and locking grooves formed therein around a press center portion of said lower mold;

a corresponding plurality of clamp rods movably received in said rod receptacle holes, each of said clamp rods having a head portion protrudable into one of said locking holes in said lower mold and including means for locking said clamp rods in position when said clamp rod is turned so as to lock said head portion in said locking groove;

a plurality of drive cylinders each having a piston rod respectively connected to one of said clamp rods for respective advancement of said clamp rods;

a plurality of rod rotating members respectively connected to said clamp rods and which includes means for turning said clamp rods upon movement of said rod rotating members; and

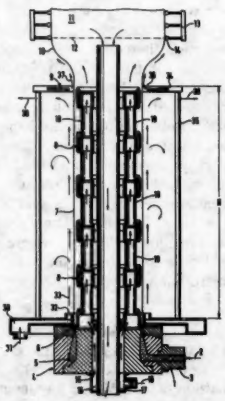
clamp rod retraction means mounted on said rod rotating members for retracting said clamp rods subsequent to rotation of said clamp rods by said rod rotating members.

4,601,649

COOLING APPARATUS FOR TUBULAR PLASTICS FILM EXTRUDED FROM A FILM BLOW HEAD

Hartmüt Upmeier, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,725
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335334
Int. Cl.[4] B29C *55/28, 47/88*
U.S. Cl. 425—72 R 8 Claims



1. A cooling apparatus for tubular plastics films extruded from a film blow head, comprising: air cooling means including coaxial tubes passing axially through a film blow head to supply cooling and inflating air and to withdraw same from a film bubble; a plurality of axially spaced inner cooling rings disposed substantially concentrically to the axis of the extruded tubular film downstream of an extruding ring nozzle of the blow head, the inner cooling rings having air guide surfaces which face the inner surface of the film tube and are convex in longitudinal section of the rings, each of the cooling rings including annular nozzle gaps formed by annular tubular members each having a radially projecting collar with an axially projecting annular lip and which are positioned upstream of the inner cooling rings as viewed in the direction of flow of the cooling air to define an annular gap with the respective cooling ring so that cooling air blown out of the annular gaps has a component of flow in the direction in which the wall of the tubular film moves; and outer cooling ring surrounding the extruded tubular film and having an annular nozzle gap oriented in a blowing direction substantially parallel to the outer surface of the tubular film; and an apertured baffle plate having an axial projection onto an enlarged diameter film bubble formed from the tubular film, which axial projection covers at least the interior inflated region of the film bubble, said baffle plate defining an annular gap with the outer surface of the tubular film, said apertured baffle plate positioned downstream

from said outer cooling ring and upstream of and adjacent to the film bubble to control the volume of flow of external cooling air that impinges on the enlarged diameter film bubble.

4,601,650

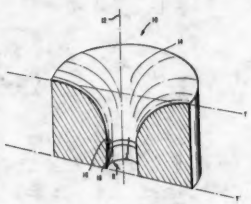
EXTRUSION DIE FOR EXTRUDING METALLIC POWDER MATERIAL

Michael J. Luton, Summit, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 524,027, Aug. 17, 1983. This application May 2, 1985, Ser. No. 729,744

Int. Cl.[4] B22F *3/18*

U.S. Cl. 425—79 **2 Claims**



1. An extrusion die for extruding rods from metallic powder materials wherein the internal contour of the die conforms substantially to the formula:

$$\frac{1}{R^2} = \frac{1}{R_o^2} + Ax$$

where R is the radius of the die contour at any given point x along the major axis of the die orifice from its entry plane;

R_o is the radius of the billet;

A is an arbitary constant.

4,601,651

APPARATUS FOR POURING CONFECTIONERY SOLUTION

Hermann-Otto Vongeheur, Neuwied, Fed. Rep. of Germany, assignor to Winkler + Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Division of Ser. No. 484,308, Apr. 12, 1983, Pat. No. 4,546,005. This application Apr. 5, 1985, Ser. No. 720,303

Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217582

Int. Cl.[4] A23G *3/12;* B29C *39/42*

U.S. Cl. 425—143 **3 Claims**

1. An apparatus for pouring confectionery solution, comprising:

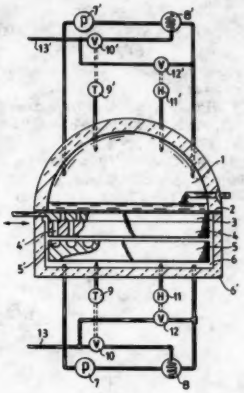
means for pouring a confectionery solution;

a nozzle plate having a multiplicity of discharge nozzles, said nozzle plate being disposed beneath said means for pouring;

a movable mold carrier having a multiplicity of molds, said mold carrier being disposed beneath and movable past said nozzle plate;

enclosure means defining a conditioning chamber which extends around said nozzle plate and which is dimensioned to also accommodate said mold carrier when disposed beneath said nozzle plate; and

means for maintaining the atmosphere contacting the confectionery solution to be poured at a temperature of the confectionery solution and at a moisture content at least



equal to the equilibrium moisture of the confectionery solution.

4,601,652

APPARATUS FOR PRODUCING A MOLDED SKIN PRODUCT

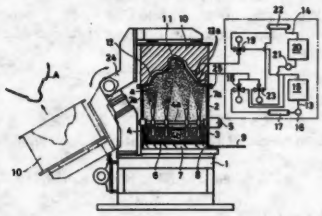
Yoshio Ando, Kawagoe; Shuno Kumagai, Sayama, and Toshiyuki Kinugasa, Hidaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 494,103, May 12, 1983, Pat. No. 4,552,715. This application Aug. 29, 1985, Ser. No. 770,485

Claims priority, application Japan, May 12, 1982, 57-78195

Int. Cl.[4] B29C *41/38, 41/46*

U.S. Cl. 425—447 **17 Claims**



1. An apparatus for producing a molded skin material comprising:

a treating container having a lower portion provided with a space therein for receiving a charge of synthetic resin powder,

a metallic mold forming with said treating container a closed chamber, said mold having a molding mold surface facing said treating container, said mold being movable to and from a closed position with said mold surface facing downwardly for forming with said treating container said closed chamber and an open position with said mold surface facing upwardly,

means for selectively heating and cooling said mold surface, and

agitation means provided in said treating container for violently agitating the synthetic resin powder charged in said treating container to spatter the same upwardly against

said mold surface, said agitation means including at least one shaft having agitation blades mounted thereon.

4,601,653

INJECTION MECHANISM IN INJECTION MOLDING APPARATUS

Yoshiharu Inaba, Kawasaki, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

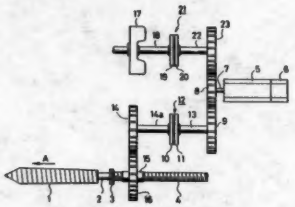
PCT No. PCT/JP84/00609, § 371 Date Aug. 22, 1985, § 102(e) Date Aug. 22, 1985, PCT Pub. No. WO85/02811, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 21, 1984, Ser. No. 772,337

Claims priority, application Japan, Dec. 22, 1983, 58-241057

Int. Cl.[4] B29F *1/04*

U.S. Cl. 425—587 **5 Claims**



1. An injection mechanism in an injection molding apparatus, comprising:

(a) a power transmission device for converting rotation of a motor to linear movement;

(b) a first screw for performing injection connected to the power transmission device;

(c) means for accumulating energy; and a first clutch;

(d) a motor having a rotating shaft which is coupled to said power transmission device through a first clutch and is coupled to said energy accumulation means through a second clutch,

wherein, during non-injection/non-metering, said second clutch is operated to cause said energy accumulation means to accumulate energy, and

wherein during injection, said first screw is moved by rotation of said motor and the energy accumulated by said energy accumulating means.

4,601,654

PULSE COMBUSTION APPARATUS

John A. Kitchen, R.R. #3, Hastings, Ontario, Canada (K0L 1Y0)

Filed Sep. 26, 1984, Ser. No. 654,439

Int. Cl.[4] F23C *11/04*

U.S. Cl. 431—1 **7 Claims**

1. A pulse combustion apparatus comprising:

a combustion chamber;

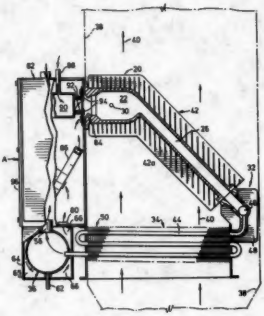
an exhaust system including an exhaust pipe forming a resonant system with the combustion chamber and a generally cylindrical exhaust cushion chamber downstream of the exhaust pipe for receiving combustion gases from said pipe and communicating with an exhaust outlet form the apparatus;

means for delivering successive fuel charges to said chamber;

combustion air supply means including a housing of generally rectangular, box shape enclosing said exhaust cushion chamber and defining a space around the chamber through which combustion air can be conducted from an air inlet to said combustion chamber for permitting heat exchange between exhaust gases in said exhaust cushion chamber and the combustion air when the apparatus is in operation, for pre-heating the combustion air;

means adapted to cause combustion air to flow in a convoluted path in said space for promoting improved heat transfer between exhaust gases in said chamber and said combustion air, said means comprising partitions between said exhaust cushion chamber and housing extending generally longitudinally of the exhaust cushion chamber and arranged to cause said combustion air to flow alternately from end to end of said chamber in said convoluted path;

a main housing section supported on said exhaust cushion chamber housing and supporting said combustion chamber, and inlet and exhaust mufflers supported on said



exhaust cushion chamber housing on opposide sides of said main housing section, said inlet muffler providing communication between a main air inlet and said space between the exhaust cushion chamber and its housing, said space additionally communicating with said combustion chamber by way of the interior of said main housing section, and said exhaust cushion chamber communicating with a main exhaust outlet from the apparatus by way of said exhaust muffler; and,

ignition means operable to initiate combustion in said combustion chamber.

4,601,655

HEATING APPARATUS

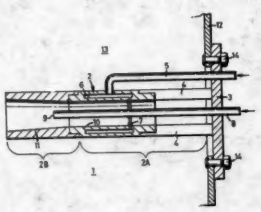
Eric K. Riley, West Midlands; Roger Dudill, Crewe, and Philip J. Young, Whitchurch, all of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 22, 1984, Ser. No. 662,852

Claims priority, application United Kingdom, Oct. 21, 1983, 8328265; Aug. 31, 1984, 8422112

Int. Cl.[4] F23J *5/02*

U.S. Cl. 431—116 **4 Claims**



1. An oxy-fuel burner comprising in combination;

means for mounting said burner to a device to be heated such as a combustion chamber;

a cylindrical first burner portion open at opposite ends and fixed to said mounting means in a manner to permit the

atmosphere in said device to be heated to circulate behind said first burner portion and into an open end, said first burner portion including Coanada effect opening means located between said opposite ends to inject oxygen into the interior of said first burner portion to cause entrainment of said atmosphere in said oxygen by means of the Coanda effect;

a second burner portion being generally cylindrical in shape, said second burner portion or tip fixed to said first burner portion so that the first and second burner portions form a continuous passage for said oxygen and entrained atmosphere, the interior passage of said second burner portion forming an outwardly diverging nozzle; and

means to inject fuel into the interior of said passage formed by said first and second burner portions to mix with said atmosphere and oxygen in said passage.

4,601,656

GAS FLOWRATE REGULATING DEVICE FOR A LIQUEFIED-GAS LIGHTER

Honore Calgaro, Annecy, France, assignor to S. T. Dupont, Paris, France

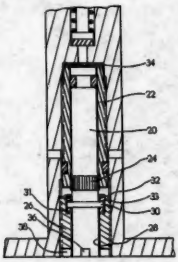
PCT No. PCT/FR83/00161, § 371 Date Mar. 26, 1984, § 102(e) Date Mar. 26, 1984, PCT Pub. No. WO84/00601, PCT Pub. Date Feb. 16, 1984

PCT Filed Jul. 29, 1983, Ser. No. 600,110

Claims priority, application France, Jul. 29, 1983, 82 13264

Int. Cl.[4] F23D *14/78*

U.S. Cl. 431—344 **4 Claims**



1. A device for regulating the gas flowrate of a liquified-gas lighter of the type having an expander body provided in the lighter body which includes an elastic permeable disk (34, 48) traversed by gas and having an annular and a central zone, said device comprising a first compression element (22, 50) adapted for compressing said annular disk zone and a second compression element (20, 54) adapted for compressing said central disk zone and which further functions as a control element for the first compression element, the first compression element comprising an annular compression screw screwed into the expander body, the second compression element being slidably mounted in the first compression element and rotationally coupled to the first compression element so that rotation of the second compression element can axially displace the first compression element to compress said annular zone, said device further including a control element for the second compression element, said control element being screwed into the expander body and arranged in operational communication with the second compression element to provide non-rotational axial displacement of the second compression element on rotation of the control element for the second compression element to compress said central zone.

4,601,657

PROCESS FOR THE CALCINATION OF A PULVERIZED MINERAL MATERIAL

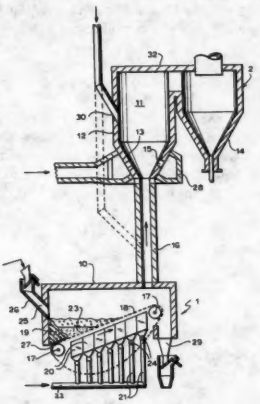
Jean-Pierre Henin, La Madeleine, and Philippe Niel, Lille, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Oct. 29, 1984, Ser. No. 665,625

Claims priority, application France, Oct. 28, 1983, 83 17270

Int. Cl.[4] F27B *7/02*

U.S. Cl. 432—14 **6 Claims**



1. A process for the calcination of a pulverized mineral material, which comprises the steps of

(a) gasifying pieces of a solid fuel in a fluidized bed hearth wherein the fluidized bed is maintained at a depth decreasing progressively from a first zone whereto the solid fuel is delivered to a second zone wherefrom residual ashes are removed by blowing air from below through the fluidized bed hearth and the air is blown through the fluidized bed at a speed decreasing from the first to the second zone until the solid fueld has been gasified and is disengaged from the fluidized bed hearth in an upwardly moving flow of gaseous fuel entraining the very finest solid fuel particles in suspension therein,

(b) selecting the granulometry of the solid fuel particles so that the particles entrained with the gaseous fuel out of the fluidized bed hearth constitute about 20% to 50% of the fuel mass,

(c) guiding the flow of gaseous fuel and the fuel particles suspended therein upwardly through a substantially vertical conduit at a speed of ascension in excess of 20 meters/-second to a separate calcination chamber, and burning the gaseous fuel and the fuel particles in the separate calcination chamber, and

(d) mixing air and the pulverized mineral material with said flow of gaseous fuel to burn the gaseous fuel and the solid fuel particles suspended therein until the burned fuel furnishes the required calories for the calcination.

4,601,658

METHOD OF MEASURING THE WATER CONTENT OF CHARGES IN A SHAFT FURNACE

John Lückers, Plainevaux, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Aug. 13, 1984, Ser. No. 640,441

Claims priority, application Luxembourg, Aug. 11, 1983, 84958

Int. Cl.[4] F27D *19/00*

U.S. Cl. 432—37 **3 Claims**

1. A method of measuring the water content of charge mate-

rials in a shaft furnace, comprising the steps of introducing a known quantity of material into the shaft furnace; analyzing the gases emerging from the throat of said shaft furnace; and utilizing the results of said analysis to calculate the value of the water content of the charged material;

the measurement of the water content of the charged material being calculated from the variation of a value proportional to the water content of the gases collected in the throat of the shaft furnace;

the development of the water content of the gases collected in the throat of the shaft furnace being followed before, during and after the introduction of the charge.

4,601,659

SKID RAIL

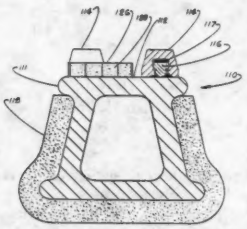
Charles G. Webster, West Lothian, United Kingdom; John S. Smith, and Frank Campbell, Jr., both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 14, 1984, Ser. No. 620,632

Claims priority, application European Pat. Off., Nov. 9, 1983, 83306830

Int. Cl.[4] F27D *3/02*

U.S. Cl. 432—234 **13 Claims**



1. A skid rail for a reheat furnace comprising

a hollow structural member having an upper flat surface,

a support block having a leg secured to said flat upper surface of said structural member and flanges extending outward at the upper end of said leg,

a wear bar having an axial opening extending therethrough which is open at its lower portion and wider at its upper portion to receive said support block therein, and

means for securing said wear bar on its support block to prevent axial movement of the wear bar with respect to said upper surface of said hollow structural member,

said wear bar being of a material having low thermal conductivity at elevated temperatures.

4,601,660

LOADING APPARATUS FOR HEAT TREATMENT FURNACE

Rolf Schuster, Hanau, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 18, 1985, Ser. No. 746,052

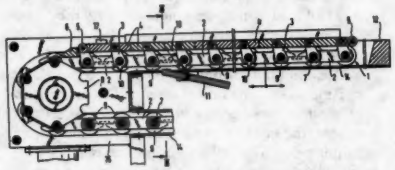
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430118

Int. Cl.[4] F27D *3/00*; F27B *9/27*; B65G *25/00*

U.S. Cl. 432—239 **7 Claims**

1. A loading apparatus for conveying a charging grate into a heat treatment furnace comprising a furnace having an opening for receiving a charging grate, a charging grate, at least one sprocket chain strand connected to said grate, guide rail means extending through said opening in said furnace, said strand having links each having a roller engaging said guide rail means, each said roller having an axle, said charging grate having a selected length,

said chain strand having at intervals corresponding approximately to said selected length a plurality of pairs of swivelable, upwardly directed rocker arms having mounted at their ends support segments, said rocker arm pairs being arranged in series from adjacent one end of said chain



strand a support block mounted after the last one of said pair of rocker arms and said last support segment having a retaining cam associated therewith.

4,601,661

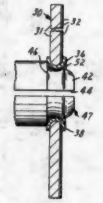
DENTAL MANDREL AND DETACHABLE ABRASIVE DISK

D. Robert Du Bé , and Lawrence A. May, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 21, 1980, Ser. No. 170,561

Int. Cl.[4] A61C *3/06*

U.S. Cl. 433—134 **19 Claims**



1. An abrading device, comprising:

(a) a circular abrasive disk, said disk having a central aperture and a grommet through said aperture, said grommet being firmly attached to said disk and having a circular hole whose axis is essentially perpendicular to said disk; and

(b) a rod-like mandrel having a driving end and a working end, said driving end being adapted to be mounted in a powered dental tool, said working end comprising:

(i) a knob-like terminal portion having in axial cross-section a circular shape with a maximum diameter equal to or greater than the diameter of said circular hole in said grommet;

(ii) a shoulder between said knob-like terminal portion and said driving end, said shoulder having in axial cross-section a minimum diameter greater than the diameter of said circular hole in said grommet; and

(iii) means for providing static disengagement and dynamic driving engagement between said knob-like terminal portion and said grommet when said grommet is positioned around said knob-like terminal portion.

4,601,662
METHOD OF RESTORING POSTERIOR TEETH WITH INTERPROXIMAL DECAY, AND KIT OF ARMAMENTARIUM THEREFOR

Jeffrey M. Galler, 18 Copper Beech La., Lawrence, N.Y. 11516

Filed Aug. 14, 1984, Ser. No. 640,803
Int. Cl.[4] A61C 5/04
U.S. Cl. 433—226 10 Claims

1. A method of restoring a posterior tooth affected by interproximal decay, comprising the steps of:

(a) drilling the affected tooth, on the side thereof on which the decay is located, generally horizontally to form a groove intersecting the site of the decay and extending from the buccal to the lingual sides of the affected tooth;

(b) scraping the groove with the cutting edge portion of a spoon excavator having the cutting edge formed on the extremity of an arm extending substantially at a 90° angle to the handle of the excavator and having the handle oriented at an angle of about 30° to a plane which includes the arm and is substantially perpendicular to the general plane of the cutting edge;

(c) positioning a separator having two arms with opposed wedge elements into the mouth of the patient so as to have the separator arms lie along the buccal and lingual sides of the row of teeth where the affected tooth is located, and operating the separator arms to force said wedge elements into the gingival space between the drilled side of the affected tooth and the confronting side of the next adjacent tooth for spreading those teeth apart and separating the contact points thereof from each other;

(d) inserting a matrix strip between the spread apart teeth into closely overlying relation to the drilled side of the affected tooth, and securing the inserted matrix strip in place to form a tight outer wall for the groove;

(e) injecting a curable dental composite into the groove of the affected tooth through an aperture in the matrix strip, and continuing the injection until the groove is filled;

(f) curing the injected dental composite; and

(g) removing the matrix strip and the separator from the mouth of the patient.

4,601,663
HELICOPTER SIMULATOR

Alfred E. Allison, P.O. Box 95, Chanute, Kans. 66720, and Ronald J. Dillard, 940 Charlotte, Longwood, Fla. 32750

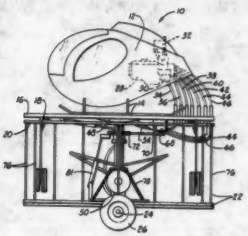
Filed Jun. 13, 1985, Ser. No. 744,192
Int. Cl.[4] G09B 9/08
U.S. Cl. 434—33 7 Claims

1. A helicopter simulator for simulating actual flight in a helicopter, the simulator comprising:

a helicopter airframe mounted on a rotatable platform, the platform received on a stationary base;

a hydraulic motor having hydraulic lines connected to a hydraulic pump operated in the airframe and connected to a first instrument control, the hydraulic motor connected to a main support shaft attached to the platform, the motor rotating the platform on top of the main support shaft;

lift means connected to the platform and the base for raising and lowering the platform on the base and connected to a second instrument control in the airframe; and

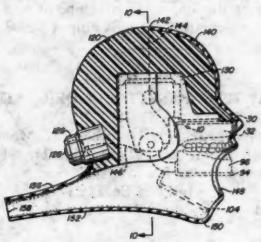


a fore and aft, right and left tilt means mounted on the platform for tilting the platform on the base and connected to a third instrument control in the airframe.

4,601,664
TEMPOROMANDIBULAR JOINT ARTICULATOR AND DENTAL MANIKIN INCORPORATING IT

Cosmo D. Bertino, III, Norristown, and N. Dominic Marucci, Philadelphia, both of Pa., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 18, 1985, Ser. No. 712,482
Int. Cl.[4] G09B 23/28
U.S. Cl. 434—264 14 Claims



1. A temporomandibular joint articulator comprising:

(a) a maxillary frame having at least left, right, and front sides;

(b) means attached to the front side of the maxillary frame for retaining a maxillary practice denture;

(c) jaw movement guides slidably attached to the left and right sides, respectively, of the maxillary frame, each of the jaw movement guides being provided with a shaped recess in a lower end thereof;

(d) a mandibular assembly comprising, for each jaw movement guide,

(i) a jaw plate having an upper and a lower end;

(ii) a roller, slidably attached to the jaw plate;

(iii) a condyle, attached to the jaw plate at the upper end thereof; and

(iv) tension means, attached between proximate the lower end of the jaw plate and the lower end of the corresponding jaw movement guide;

the roller and condyle being attached to the jaw plate to cooperate with the shaped recess in the jaw movement guide to simulate a human temporomandibular joint; and

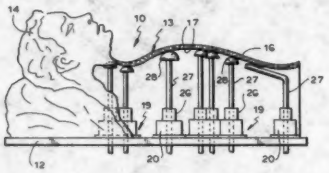
(e) means connecting the jaw plates, which connecting means also comprises means for retaining a lower practice denture.

4,601,665

CARDIAC TRAINING MANNIKIN

Francis B. Messmore, 130 E. 67th St., New York, N.Y. 10021

Filed Apr. 1, 1985, Ser. No. 718,841
Int. Cl.[4] G09B *23/32*
U.S. Cl. 434—267 **15 Claims**



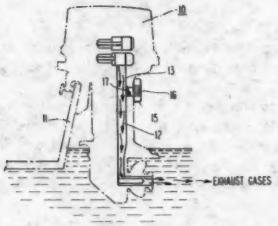
1. A teaching device comprising a mannikin having a movable outer wall, a plurality of electromechanical transducers having mechanical outputs coupled to different parts of said outer wall, a memory device digitally storing a predetermined program, control means programmed by said memory device and having a plurality of analog electrical output signals responsive to said program, means for individually energizing said transducers in response to said output signals to move said respective wall parts in a predetermined manner, a stethoscope applicable to different parts of said mannikin, and audio means responsive to the applied position of said stethoscope to said mannikin for supplying an audible signal to said stethoscope in accordance with a corresponding part of said digital program, said audio means including a sound synthesizer coupled to the output of said control means and producing on audio signal of a frequency responsive to its digital signal input and a modulator for varying the amplitude envelope of said audio signal in response to the controller means output signal.

4,601,666

AIR EXHAUST BY-PASS FOR UNDERWATER EXHAUST SYSTEMS

Garfield A. Wood, Jr., 400 Teakwood Dr., Monroe, La. 71203

Continuation of Ser. No. 497,651, May 24, 1983, abandoned.
This application Feb. 12, 1985, Ser. No. 700,337
Int. Cl.[4] B63H *21/32*
U.S. Cl. 440—89 **12 Claims**



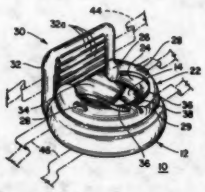
1. In a marine propulsion system for a fishing boat having a motor with an integral underwater exhaust system, the improvement of reducing the fish sensitive low frequency underwater noise generated by the exhaust during low speed operation of the motor comprising a muffled above water outlet to the air for the exhaust, and selectively operated means comprising a manually controlled selective valving mechanism for rerouting the exhaust through said muffled above water outlet to the air while preventing exhaust emanations from either impinging directly upon the water surface or passing to any underwater level by blocking movement of the exhaust to the water level at a point above the water surface for discharge through the muffled outlet to the air at low speed operation and for allowing the exhaust system to return to normal underwater exhaust conditions at faster speed operation where the overall sound frequencies become higher.

4,601,667

GAS-INFLATABLE, FLOATABLE PORTABLE SEAT

Diane H. Hull, 1491 Ashland, #25E, Des Plaines, Ill. 60016

Filed Jul. 8, 1985, Ser. No. 752,610
Int. Cl.[4] B63B *35/74*
U.S. Cl. 441—131 **20 Claims**



1. A gas-inflatable, floatable, portable seat for supporting a person in sitting position and adapted to be attached to a boat or other vehicle or floatable independently on the water, said seat comprising:

a first, generally annular-shaped, lower inflatable float chamber defining a lower leg compartment for said person and adapted to provide bouyancy when placed in water;

a second, generally annular-shaped, upper inflatable float chamber mounted on top of said first float chamber formed with an open segment on a back side thereof and forming arm rests on opposite sides of said open segment;

an inflatable seat structure comprising an upstanding back projecting upwardly of said second float chamber having a generally upstanding outer back face and a seat cushion projecting inwardly of said back into said leg compartment through said open segment of at least said second float chamber; and

a bottom wall structure including relatively dense material forming a closed lower end of said leg compartment adjacent a lower level of said first float chamber when inflated for providing ballast for maintaining said seat with said back in an upstanding position when placed in the water.

4,601,668

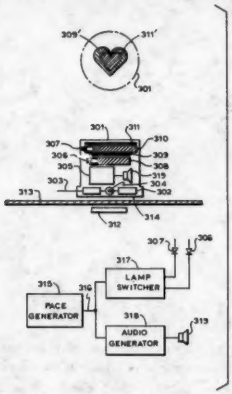
DOLL HEART MONITORING TOY

Vladimir Sirota, 130 W. 67 St., New York, N.Y. 10023

Filed May 15, 1985, Ser. No. 734,173
Int. Cl.[4] A63H *33/26*
U.S. Cl. 446—130 **18 Claims**

1. A doll heart monitoring toy, comprising a doll element; a stethoscope element; electronic means producing at least one characteristic which is an immitation of a heart activity; and a magnetic member operative for turning on said electronic means when said magnetic member and at least a part of said electronic means are brought into proximity with one another, said electronic means being arranged in one of said elements, while said magnetic member is arranged in the other of said elements so that when said stethoscope element is brought into proximity to one part of said doll element said electronic means is turned on and said at least one characteristic which immi-

tates heart activity is produced, said electronic means including a sensor arranged to sense pulse beats of a user, and a signal



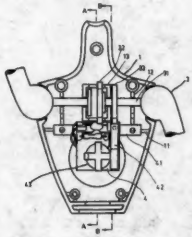
generator arranged to generate signals corresponding to the pulse beats sensed by said sensor.

4,601,669

SOUNDING DEVICE FOR DOLLS

Chyi-Hun Hsieh, 3F, 2, Lane 21, Fwu-Yuan Street, Shin-Diann City, Taipeishiann, Taiwan

Filed Jan. 11, 1985, Ser. No. 690,767
Int. Cl.[4] A63H *3/28*
U.S. Cl. 446—303 **3 Claims**



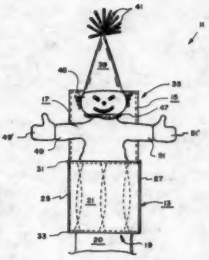
1. A doll which comprises a body with two arms and a sounding device mountable in the interior of an upper part of the body of said doll and actuatable by the rotation of at least one arm of the doll, said sounding device comprises a first rib, a second rib and a third rib on a left side of the doll and a first rib, a second rib and a third rib on a right side of the doll positioned within the upper part of the body of the doll, each first rib being vertically positioned, each second rib being horizontally positioned and respectively intersecting each said first rib, the two third ribs forming a square pattern, one shaft positioned on each respective left and right side of the doll and connected to each respective arm of the doll and pivotable in response to manual rotation of the arm, each shaft being rotatably mounted on each respective first rib, press-camming means and restrict-camming means mounted on at least one of said shafts, a sound-making element mounted on the first and second ribs at their intersection point, said press-camming means upon rotation of the arm of the doll actuating said sound-making element, and said restrict-camming means being adpated to limit the motion of said press-camming means.

4,601,670

HAND PUPPET

Sharon L. Williams, Rte. 3 Box 149, Covington, Tenn. 38019

Filed Jul. 3, 1985, Ser. No. 751,482
Int. Cl.[4] A63H *3/14*
U.S. Cl. 446—327 **1 Claim**



1. A device for use with a hand for the amusement of children, said device comprising:

(a) a base member having box-like upwardly extending side walls having a first end which is the top thereof, a second end which is the bottom thereof, and having a hollow interior therethrough; said side walls of said base member including a front side wall, a back side wall a right side wall and a left side wall; said front side wall, said back side wall, said right side wall and said left side wall including edges thereof which are securely attached together to define said base member;

(b) a top member attached to said first end of said base member and movable between an open position and a closed position in which said first end is closed; and

(c) a body member having a hollow interior, said body member including a head, a right arm, a left arm and a lower portion attached to the interior of said base member adjacent said second end thereof; said first end of said back side wall and said top member being attached together allowing said top member to move between an open position in which said top member is substantially aligned with said back side wall and a closed position in which said top member is covering said first end of said front side wall, right side wall, left side wall and encloses said body member within said interior of said base member; said front side wall, said back side wall, said right side wall, said left side wall, said top member and said body member being comprised of a soft, flexible material and joined together by strands of thread.

4,601,671

HUGGABLE TOY MECHANISM

Robert DeMars, 7932 Maestro, Canoga Park, Calif. 91304

Filed May 14, 1985, Ser. No. 733,896
Int. Cl.[4] A63H *3/20*
U.S. Cl. 446—330 **8 Claims**

1. A huggable toy mechanism for placement in a toy comprising:

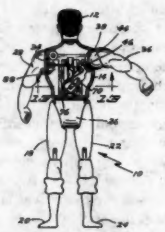
(a) a pair of spaced apart substantially parallel plates, forming a front plate and a back plate;
(b) resilient means between said plates, supporting said plates in a substantially parallel configuration; and
(c) hingedly positioned members extending from said plates and adapted to move pivotally forward in a hugging motion when said plates are squeezed together, said hingedly positioned members comprising three segments:
(1) a first segment extending laterally from said back plate, rigidly attached thereto and having a relatively short length,
(2) a second segment hingedly attached to said front plate by a first hinge means and including a first portion bent forward toward said back plate and a second bent portion substantially parallel to the plane of said first segment, and
(3) a third segment hingedly attached at one end to said first segment by a second hinge means and at the other end to said first bent portion of said second segment by a third hinge means.

4,601,672

ACTION FIGURE IN WHICH MANIPULATION OF ONE ARM PRODUCES ROTATION OF BOTH LEGS ABOUT A VERTICAL AXIS

Stuart A. Cook, New Richmond, Ohio; John F. Mayer, Fort Thomas; David W. Tucker, Florence, both of Ky., and William N. Smith, Batavia, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.

Filed Feb. 8, 1985, Ser. No. 699,622
Int. Cl.[4] A63H *3/20*
U.S. Cl. 446—330 **19 Claims**



1. A toy action figure comprising a hollow torso portion, a pair of legs, means mounting said legs for rotation about a generally vertical axis relative to said torso portion, a pair of arms, means mounting one of said arms for pivotal movement in a lateral direction relative to said torso portion, means interconnecting said one arm to said leg mounting means for causing rotation of said legs in one rotative direction about said axis when said one arm is manually pivoted in a lateral direction toward said torso, and spring means for biasing said one arm away from said torso portion.

4,601,673

ARTIFICIAL EYE

Gayle L. Nasca, 1060 Rossmore Ave., Baton Rouge, La. 70810

Filed Jun. 22, 1984, Ser. No. 623,516
Int. Cl.[4] A63H *3/38*
U.S. Cl. 446—389 **17 Claims**

1. An artificial eye for toy dolls with open eye sockets comprising:
a. sclera means for insertion into one of the eye sockets, and sclera means having a recessed portion with a peripheral edge wall therein for receiving a cornea, said sclera means being made from a soft, resilient, elastic material that can conform to the eye socket of the doll;
b. an annular, transparent cornea connected to said sclera by occupying the recessed portion and abutting the peripheral edge wall of the recessed portion thereby defining an annular seam between the sclera means and the cornea;
c. transparent, resilient and elastic, flexible coating means for

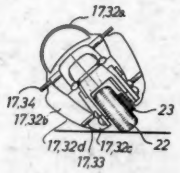
encapsulating the combination of the cornea and sclera means so that the seam is covered by the coating means, the combination of the sclera means, cornea and coating means defining a soft, pliable, elastic unit.

4,601,674

TOY MOTORCYCLE

Rikihachiro Koizumi, Narashino, Japan, assignor to Kabushiki Kaisha Hanzawa Corporation, Tokyo, Japan

Filed May 3, 1985, Ser. No. 730,677
Claims priority, application Japan, Apr. 15, 1985, 60-78565
Int. Cl.[4] A63H *00/00*
U.S. Cl. 446—440 **6 Claims**



1. A toy motorcycle comprising:
a body having a frame and a hood doubling as a cowling, said frame and said hood being made of a light-weight material;
a freely rotatable front wheel supported at a front portion of said body by a front wheel support;
a rear wheel supported for rotation at a rear portion of said body for driving said toy;
a drive source doubling as a balancing weight disposed interiorly of said body at a lower position than the center of gravity of the toy for applying driving power to said rear wheel and for righting the toy when said toy falls over due to collision with an obstacle while said toy is travelling on the ground;
a power transmission system coupling said drive source with said rear wheel; and
means including a plurality of projections formed on peripheral portions of said body and of said front wheel support for facilitating self-righting of the toy;
wherein when the toy falls over due to collision with an obstacle while the toy is travelling along the ground, said projections come into contact with the ground to bring said rear wheel into contact with the ground and said toy is righted to resume travelling by the righting function of

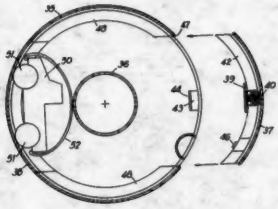
said drive source and the driving function of said rear wheel.

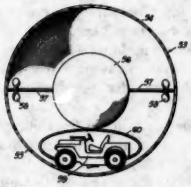
4,601,675

MECHANIZED TOY BALL

Donald E. Robinson, 4148 B S. Memorial Parkway, Huntsville, Ala. 35802

Filed May 25, 1984, Ser. No. 613,804
Int. Cl.[4] A63H *17/26*
U.S. Cl. 446—449 **13 Claims**





1. A mechanized toy ball comprising a spherical shell having inner and outer concentric surfaces, and a mechanically guided friction drive means including a power source and a motor for the ball contained wholly within the shell and having a rotary drive element in driving contact with said inner surface, and said drive means including means for imparting rolling directional movement to the shell, said inner surface being spherical, and the last-named means comprising a sphere fixed within the shell in spaced concentric relationship to said inner surface and guidingly engaging the friction drive means within the shell.

4,601,676

DAMPER DISC

Hiromi Tojima, and Kouji Kajitani, both of Hirakata, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Sep. 16, 1982, Ser. No. 418,771
Int. Cl.[4] F16D *3/14, 3/80*
U.S. Cl. 464—24 **3 Claims**

1. A damper disc comprising:

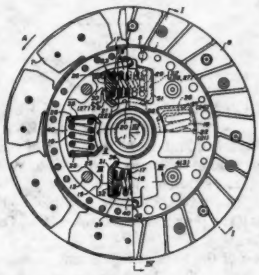
a spline hub;

a radial flange formed at the hub;

a pair of cases rotatably mounted on the spline hub and connected to facings at the radially outer end thereof, each one of said pair of cases being disposed on opposite sides of the flange;

circumferentially spaced plural compressible coil spring assemblies operably connecting the cases and the flange together, at least one of said coil spring assemblies including axially aligned and concentric first and second coil springs, said first coil spring disposed within said second coil spring, such that one of said springs begins to compress before the other;

a sealed spring chamber formed around each of said spring assemblies by the cases and having only sealed narrow spaces connecting the springs chambers together; and



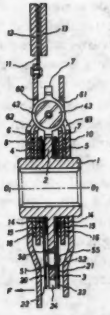
spring seats disposed at both ends of each spring assembly, said chambers being filled with oil, so that the oil provides a resistance force to the moving spring seats and said chambers are only slightly larger in cross-section than said spring seats to enable said spring seats to function as hydraulic pistons, wherein at least one of said spring seats corresponding with said first and second springs has two portions movably independently from each other, a first portion supporting said first spring and a second portion supporting said second spring, said first portion engaging a projection on said flange to cause said first spring to compress before said second spring which is not engaged with said projection.

4,601,677

DUAL ACTION TORSION DAMPING DEVICE

Hiroshi Takeuchi, Higashiosaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Feb. 1, 1985, Ser. No. 697,195
Claims priority, application Japan, Feb. 17, 1984, 59-21852[U]
Int. Cl.[4] F16D *3/14*
U.S. Cl. 464—68 **7 Claims**



1. A damper disc comprising a hub having an integral flange

provided on the outer periphery thereof, a clutch plate and a retaining plate rotatably fitted on said hub and disposed on opposite sides of said flange, a pair of first subplates and a pair of second subplates rotatably fitted on said hub, said first subplates being disposed on opposite sides of and adjacent to said flange, said second subplates being disposed between said first subplates and said clutch plate and retaining plate, a weak torsion spring operatively interposed between the flange and the first subplates, and a plurality of strong torsion springs arranged in groups, each group operatively interposed in series between the first and second subplates and between the second subplates and the clutch plate and the retaining plate.

4,601,678

TORSIONALLY RESILIENT COUPLING WITH A CONNECTING ELEMENT

Franz J. Wolf, and Hubert Pletsch, both of Bad Soden-Salmünster, Fed. Rep. of Germany, assignors to WOCO Franz-Josef Wolf & Co., Fed. Rep. of Germany

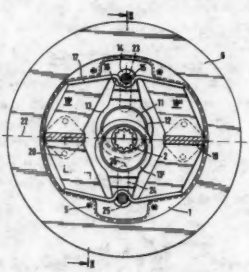
Filed Aug. 15, 1984, Ser. No. 640,839

Claims priority, application European Pat. Off., Sep. 14, 1983, 83 109086.5

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] F16D *3/76, 13/64*

U.S. Cl. 464—83 **3 Claims**



1. Torsionally resilient coupling comprising two coupling halves, at least one eccentric mounted on one of said coupling halves and being displaced along a translatory path of travel upon rotation of said one coupling half, at least one connecting rod being disposed within said translatory path of travel of said eccentric, at least one support plate resting radially outwards upon at least one resilient intermediate element frictionally braced radially inwards and connected to one of the two coupling halves and being articulated in translation rotatably about a journal pin via the connecting rod to the eccentric so that the intermediate element is stressed, tensioning or relaxing the resilient intermediate element in the case of a relative rotation of the other coupling half which is connected integrally with the eccentric, and a side plate provided on at least one side of said connecting rod and mounted to the same coupling half as said resilient intermediate element, said side plate including a slot defining a guideway for and engaged by said journal pin, said slot being aligned radially relative to the coupling and arranged so that the articulation point is guided in such a way that the force introduced to said connecting rod via said eccentric is symmetrically distributed over said resilient intermediate element such that the resilient intermediate element is stressed with a compressive force in the case of a mutual rotation of the two coupling halves.

4,601,679

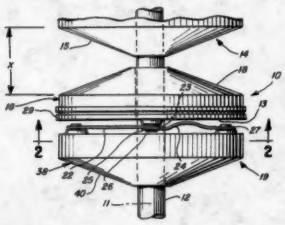
VARIABLE PULLEY TORQUE DRIVE MEANS

Thomas J. Bock, Streamwood, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 16, 1985, Ser. No. 734,695

Int. Cl.[4] F16H *11/06*

U.S. Cl. 474—11 **16 Claims**



1. A variable pulley torque drive system of a longitudinal pulley drive system having at least one rotatable shaft with a longitudinal axis;

a variable pulley mounted on said shaft;

said pulley comprising a fixed sheave mounted and secured on said shaft and a movable sheave mounted on and axially movable on said shaft parallel to said longitudinal axis;

said movable sheave defining a flange face and a back face;

said torque drive system having a drive member mounted on and secured to said shaft in proximity to said movable sheave back face;

said drive member defining at least one pivot;

said movable sheave defining at least one spaced pivot on said back face;

a first flexible strap and a second flexible strap to transfer torque loading between said movable sheave and said shaft, each of said straps having a first end and a second end, said first ends connected to at least one of said pivots on either of said back face or said drive member and said second ends independently connected to said pivots of the other of said back face or said drive member.

4,601,680

CONTROL APPARATUS FOR USE OF A CONTINUOUSLY VARIABLE TRANSMISSION

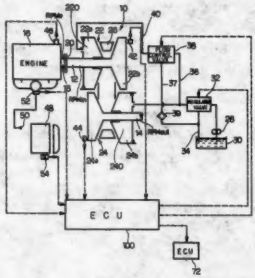
Setsuo Tokoro; Tomoyuki Watanabe, and Takashi Shigematsu, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 18, 1985, Ser. No. 712,608

Claims priority, application Japan, Apr. 18, 1984, 59-76682

Int. Cl.[4] F16H *11/06*

U.S. Cl. 474—11 **6 Claims**



1. An apparatus for controlling a rate of changing a RPM

ratio in a continuously variable transmission connected to an engine, the transmission having a driving pulley mounted on an input shaft, the driving pulley comprising a fixed member and a movable member, the movable member being actuated by a hydraulic cylinder to form a V-shaped opening between the movable member and the fixed member, a driven pulley mounted on an output shaft, the driven pulley comprising another fixed member and another movable member, said another movable member being similarly actuated by another hydraulic cylinder to form another V-shaped opening between said another movable member and said another fixed member and an endless belt member spanning the pulleys so that an effective diameter of the pulleys can be varied at different rates with regard to each other so that different speed ratios can be obtained, comprising:

a first control means for detecting a signal which indicates a prompt acceleration of a vehicle, required by an operator;

a flow control means for draining an amount of oil supplied into said hydraulic cylinder within a first prescribed time period from the time when the prompt acceleration of the vehicle is detected by the first control means;

a second control means for maintaining an amount of oil supplied into said hydraulic cylinder to zero during a second prescribed time period after the first prescribed time period elapses; and

a regulator means for supplying a pressurized line pressure into said flow control means and said another hydraulic cylinder, whereby the amount of oil drained from the hydraulic cylinder of the driving pulley is made to its maximum within the first prescribed time period, thereby promptly lowering the RPM ratio in the continuously variable transmission, and the draining of oil from the hydraulic cylinder of the driving pulley is stopped within the second prescribed time period, thereby maintaining a RPM ratio in a continuously variable transmission to the value at the time when the first prescribed time period elapses.

4,601,681

HYDRAULIC CONTROL APPARATUS AND AN AUTOMATIC GEAR BOX FOR MOTOR VEHICLES

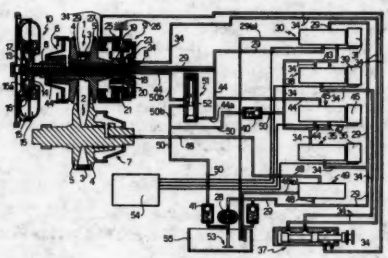
Ugo Costelli, Turin; Giulio Dotti, Milan, and Luciano Moretti, Turin, all of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 346,412, Feb. 8, 1982, abandoned. This application Mar. 12, 1985, Ser. No. 711,072

Claims priority, application Italy, Jul. 17, 1981, 67992 A/81

Int. Cl.[4] F16H *11/04*

U.S. Cl. 474—28 **5 Claims**



1. A continuous automatic gear box for a motor vehicle comprising:

a driving shaft;

a reduction-reversing means mechanically coupled to said driving shaft; a driving pulley mechanically coupled to said reduction-reversing means, so that when said reduction-reversing means is engaged, motion from said driving shaft is transmitted to said driving pulley;

a freely rotating pulley;

an endless belt for transmitting motion from said driving pulley to said freely rotating pulley, said endless belt having a winding radius for each of said pulleys, said winding radius comprising the distance between the center of rotation of either pulley and the closest point of the endless belt;

said driving pulley and said freely rotating pulley each comprising movable and stationary disks, said movable disk being axially movable relative to said stationary disk by means of an hydraulic cylinder in order to vary the winding radius of said belt on each of said pulleys;

said reduction-reversing means including a first and second clutch, said clutch when engaged transmits motion from said moving shaft to said driving pulley designed to propel the motor vehicle forwardly, said second clutch when engaged transmits motion from said driving shaft to said driving pulley designed to propel said motor vehicle in reverse movement; and

a control means for controlling said movable disk of each of said pulleys, and said first and second clutch of said reduction-reversing means, said control means comprising:

a source of fluid under pressure;

a flow regulating valve;

a main duct connecting said source of fluid under pressure to said flow regulating valve and from said flow regulating valve to said movable disk on said driving pulley;

a second duct fluidly connected to said movable disk of said freely rotating pulley;

a pressure regulating valve;

a selective valve; and

a third duct fluidly connected with and from said main duct to said pressure regulating valve, and from said pressure regulating valve to said selecting valve, and from said selecting valve to said first and second clutches of said reduction-reversing means, said third duct being connected to said main duct upstream from said flow regulating valve.

4,601,682

DERAILLEUR FOR A BICYCLE

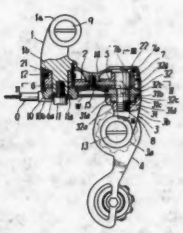
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jan. 27, 1984, Ser. No. 574,332

Claims priority, application Japan, Feb. 2, 1983, 58-14770[U]; Feb. 2, 1983, 58-14771[U]; May 21, 1983, 58-76525[U]; May 21, 1983, 58-76526[U]

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—80 **5 Claims**



1. A derailleur for a bicycle which is operated by a control wire to change the bicycle speed, comprising:

a base member,

a movable member having a chain guide,

a first shaft means associated with said base member,

a second shaft means associated with said movable member,

a stiff swingable member for allowing said movable member to move with respect to said base member while keeping each of said shaft means parallel to each other and including a first boss supported swingably to said base member by said first shaft means and a second boss for supporting

said movable member rotatably by means of said second shaft means, and

at least one regulator for regulating rotation of said movable member with respect to said swingable member, said at least one regulator extending lengthwise of and along an outside extremity of said swingable member and being retained at both lengthwise ends radially outwardly relative to said first and second shaft means,

at least one of said base member and said movable member being divided into divided portions axially of said first shaft means and said second shaft means respectively, divided end faces of said divided portions being disposed opposite to each other around one of said first and second shaft means, a fixing means for fixing said divided portions being disposed between said divided portions, said control wire including a terminal portions at which said control wire is secured between said divided portions of one of said base member and said movable member.

4,601,683

BELT TENSIONER, PART THEREFOR AND METHODS OF MAKING THE SAME

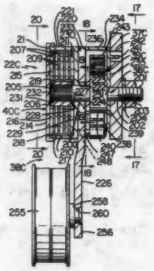
Randy C. Foster, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 391,642, Jun. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 301,351, Sep. 11, 1981, Pat. No. 4,413,982. This application Aug. 31, 1984, Ser. No. 646,264

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.[4] F16H *7/12, 7/08, 7/22*

U.S. Cl. 474—135 **2 Claims**



1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by and support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with force to tension said belt, and fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, said fluid dampening means comprises a rotary dampening means having a fluid therein and having at least one rotatable member disposed in said fluid, said fluid dampening means having a longitudinal axis about which said rotatable member rotates, said spring means having a longitudinal axis and being spiraled about said axis thereof, said support means comprising a shaft means having a longitudinal axis and being fixed from movement relative to said belt engaging means, the improvement wherein said member comprises a flat circular disc-like member having means for creating a shear in said fluid when said disc-like member moves in said fluid, said shaft means carrying said dampening means and said spring means in spaced apart side-by-side relation thereon with said axis of said shaft means being substantially coaxial with said axis of said rotary dampening means and said spring means whereby said rotary dampening means and said spring means are coaxially spaced apart and are coaxially aligned by said shaft means, said belt engaging means having a portion thereof disposed between said rotary dampening means and said spring means and being rotatably carried by said shaft means so as to rotate relative to said shaft means whereby said rotary dampening means and said spring means are coaxially spaced apart from each other by said portion of said belt engaging means, said rotary dampening means having a tubular portion rotatably disposed on said shaft means to rotate relative thereto, said portion of said belt engaging means being telescopically disposed on said tubular portion and being operatively interconnected thereto whereby said portions rotate in unison relative to said shaft means, said tubular portion having a part extending beyond said portion of said belt engaging means and being interconnected to said disc-like member to rotate said disc-like member in unison therewith.

4,601,684

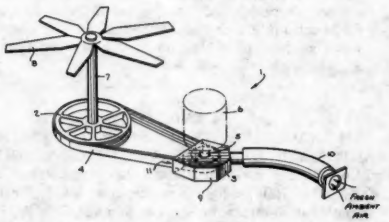
V-BELT DRIVE SYSTEM FOR CORROSIVE ATMOSPHERES

David F. Geary, Severna Park; Edward N. Schinner, Highland, and George R. Shriver, Sykesville, all of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed Mar. 7, 1984, Ser. No. 586,920

Int. Cl.[4] B62J *13/00*

U.S. Cl. 474—144 **7 Claims**



1. An improved V-belt drive apparatus including a driven sheave and a driver sheave connected by a V-belt, all contained within a zone of corrosive atmosphere, said improvement comprising:

an enclosure within said zone containing only said driver sheave and a portion of the V-belt trained thereabout;

and venting means connecting said enclosure to an ambient atmosphere outside the zone of corrosive atmosphere whereby said ambient atmosphere may flow directly from outside the zone through said enclosure to pass across said driver sheave and exhaust into said zone of corrosive atmosphere.

4,601,685

ENDLESS BELT, AND ROLLER SYSTEM WITH SUCH A BELT

Johannes C. Delhaes, Heerlen, Netherlands, assignor to Rubberen Kunststoffabriek ENBI B. V., Nuth, Netherlands

Filed Jun. 19, 1985, Ser. No. 746,389

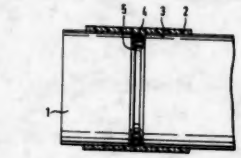
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424394

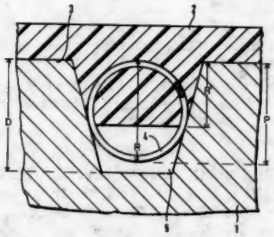
Int. Cl.[4] F16H *55/32*

U.S. Cl. 474—188 **8 Claims**

8. An endless belt, especially a conveyor or drive belt, made of an elastically deformable material, comprising a belt body having an outwardly facing surface and an inwardly facing surface, and helical spring means partially embedded in said

elastically deformable material of said belt so that said helical spring means protrude from one of said surfaces for keeping said belt on track, said helical spring means having ends which are connected to each other.





4,601,686

PRODUCTION OF TOBACCO-SMOKE FILTERS

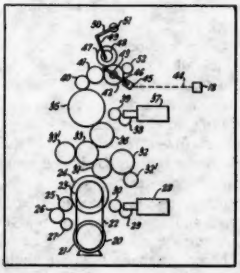
John A. Luke, Eastleigh, and David E. Sugars, Southampton, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed Jan. 28, 1982, Ser. No. 343,442

Claims priority, application United Kingdom, Feb. 18, 1981, 81 05036

Int. Cl.⁴ A24C *5/50*; B65H *43/00*

U.S. Cl. 493—43 **5 Claims**



1. Apparatus for thermally operating upon smoking-article filter-rod lengths comprising supply means for the rod lengths, a first conveyor disposed at an outlet of said supply means, a plurality of further conveyors arranged for sequential conveyance of rod lengths passing from said first conveyor, at least one of said further conveyors being arranged for conveying said rod lengths past a heatable rod-forming means, drive means operable to drive said first and further conveyors, said drive means including a slipping clutch operable upon the occurrence of a rod jam to discontinue drive to said first and further conveyors, and manually activatable drive-discontinuance means, activation of which allows selective discontinuance of drive to said first conveyor, without discontinuance of, or with recontinuation of, the drive to said further conveyors.

4,601,687

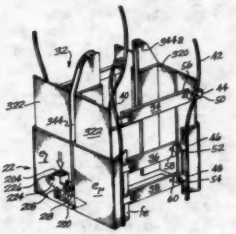
MACHINE FOR MANUFACTURE OF H-DIVIDER CONTAINERS HAVING IMPROVED COMPRESSION RESISTANCE

Donald D. Gallaher, Garretson, S. Dak., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 9, 1985, Ser. No. 689,910

Int. Cl.⁴ B31B *11/28, 11/62*

U.S. Cl. 493—89 **2 Claims**



1. In a machine for forming an inside-outside Bliss-type H-divider shipping container,

said container being made from an H-divider blank and a body blank and having a formed interior H-divider connecting opposite pairs of end walls about which a flat body blank is erected,

the body blank having a rectangular bottom panel joined along each side by parallel score lines to foldable rectangular side panels,

the bottom panel and each side panel having individual foldable flaps at each end for adhesive engagement with the exterior peripheral surfaces of the end walls, and

the end walls each having foldable flaps adapted to lie along the interior surface of the side panels at each corner, said flaps being oriented normal to the end walls in the assembled container,

the improvement which enables folding and assembly of the interior end wall flaps which comprises:

(a) split mandrel means for receiving said H-divider blank, said mandrel means having opposing spaced apart inner surfaces lying in parallel planes, the volume defined between said planes being unobstructed to allow passage therethrough of the H-divider portion of the container,

the lower portion of the mandrel means generally defining a rectangular prism approximating the inner dimensions of the container,

the mandrel means having generally open outer side faces lying in planes parallel to the opposing inner surfaces and generally solid surfaces on the outer side faces lying planes normal to the planes of the inner surfaces;

(b) opposed plow means for folding said endwall flaps, said plow means being located adjacent to the generally open outer faces of the mandrel means and having H-divider entry portions extending outside the prism planes defining the generally open outer side faces of the mandrel means, in order to engage and begin folding the H-divider endwall flaps, and having holding portions contained entirely within said side face planes so as to hold said flaps after folding in noninterfering positions while the body blank is folded and joined to the end walls of the H-divider;

(c) H-fold blank forming means mounted above the mandrel means for forming the H-divider blank into an H-divider;

(d) reciprocating downfeed means operatively associated with the mandrel means to insert the folded H-divider between the spaced apart inner surfaces of the mandrel

means and cause the endwall flaps to be folded by the plow means; and

(e) body blank folding means mounted beneath the split mandrel means for lifting and folding a body blank upwardly around the opposite generally open sides of the mandrel means and for folding the adhesive coated bottom and side panel flaps into uniting contact with the end panels.

4,601,688

APPARATUS FOR PRODUCING ENVELOPE BLANKS

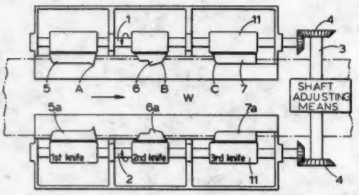
Roy A. Deverell, Bromley, England, assignor to Chapman Envelopes Limited, Kent, England

Filed Oct. 19, 1983, Ser. No. 543,509

Claims priority, application United Kingdom, Apr. 6, 1983, 8309298

Int. Cl.[4] B31B *27/14;* B26D *3/14*

U.S. Cl. 493—238 **6 Claims**



1. In an apparatus for producing envelope blanks comprising means for advancing a continuous web of paper along a horizontal path and two sets of rotatable cutter blades located one on each side of the path of travel of the web and operable to cut out portions from each side of the web, the blades on one side of the said path being located on a common shaft and the blades on the other side of the said path being located on a common shaft, the improvement wherein each set of cutter blades comprises at least three longitudinally spaced movable cutter blades, each of said movable cutter blades being positioned in longitudinal alignment with a different respective stationary blade, each movable blade being located on a cutter bracket mounted on its common shaft so that the angular position of the blade on that shaft is adjustable through 360°, each movable blade in each set being located opposite a similar movable blade in the other set to form a matching pair and the cutting profiles of said movable blades in each set being different and including a cutting point in each movable blade.

4,601,689

METHOD AND APPARATUS FOR FOLDING POLYMERIC SHEET MATERIAL AND FLEXIBLE DISK JACKETS MADE THEREBY

Mark A. Finkle, Fremont, and James D. Fishman, Pleasanton, both of Calif., assignors to Unmanned Solutions, Inc., Fremont, Calif.

Filed Mar. 12, 1984, Ser. No. 588,059

Int. Cl.[4] B31B *1/36*

U.S. Cl. 493—251 **22 Claims**

1. A method for folding polymeric sheet material, in steps comprising:

(a) Positioning the sheet material in a firmly held position;

(b) Positioning a mandrel plate such that an edge of said mandrel plate is aligned with a preselected fold line on the interior side of the sheet;

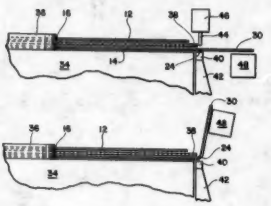
(c) Positioning an exterior heater element against the exterior portion of the sheet along said fold line;

(d) Positioning an interior heater element against the interior portion of the sheet along said fold line;

(e) Applying a preselected amount of heat by conduction to the fold line area of the sheet through said exterior heater element;

(f) Applying a preselected amount of heat by conduction to the fold line area of the sheet through said interior heater element;

(g) Retracting said upper heater element from the vicinity of the sheet;



(h) Folding the sheet along said fold line about said mandrel plate; and

(i) Annealing the fold area by applying a further preselected amount of heat through said exterior heater element.

4,601,690

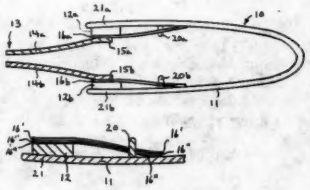
PLASTIC BAG OPENING DEVICE UTILIZING DISPOSABLE MULTILAYER ADHESIVE STRIPS

Ralph S. Jacobson, RR 6, 27970 Le Dunne Ave., Aldergrove, British Columbia V0X 1A0, Canada

Filed Oct. 15, 1984, Ser. No. 660,911

Int. Cl.[4] B31B *1/78*

U.S. Cl. 493—309 **5 Claims**



1. A device for opening the ends of thin gauge plastic bags, comprising:

a resilient U-shaped member being biased to a normally open position which allows the slit edge of a plastic bag to be positioned between the open ends thereof;

a pair of deformable pads affixed, respectively, to the insides of said ends of said U-shaped member;

a pair of nubbins affixed, respectively, to the inside surfaces of said ends of said relilient U-shaped member inwardly of said deformable pads; and

a multilayer adhesive strip stretched over each of said deformable pads and onto said nubbins, at least a portion of the exposed surface of each layer having an adhesive substance thereon to make adhesive contact with respective ones of said ends of said thin gauge plastic bag to allow said bag to be opened as said U-shaped member moves to its normally open position.

4,601,691

CARTON FEEDER

Joseph D. Greenwell, Florence, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Nov. 19, 1984, Ser. No. 672,618

Int. Cl.[4] B31B *1/80*

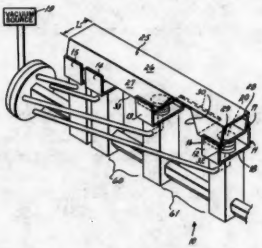
U.S. Cl. 493—313 **5 Claims**

1. In cartoning apparatus having a magazine for flat folded cartons, which when erected will have a length L, and a trans-

port conveyor located adjacent said magazine and having leading and trailing transport lugs for conveying erected cartons, a carton feeder located adjacent said magazine and transport conveyor for engaging flat folded cartons in said magazine, erecting said cartons and placing said cartons between said transport lugs, said carton feeder comprising:

a channel-shaped element, having parallel legs, said legs being spaced apart approximately a distance L,

at least one bellows suction cup mounted on said channel-shaped element and located between said legs, means



connected to said suction cup for applying a vacuum to said suction cup,

and means connected to said channel-shaped element for moving said channel-shaped element and suction cup between said magazine and said transport conveyor,

said suction cup engaging a top wall of said carton and drawing said top wall and a portion of the side walls between the legs of said channel-shaped member to substantially erect the carton and deposit it between leading and trailing lugs of said transport conveyor.

4,601,692

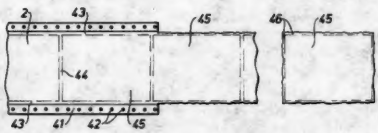
METHOD AND APPARATUS FOR THE MANUFACTURE OF PAPER SHEETS HAVING DECORATIVE EDGES

Hans Rausing, Wadhurst, Great Britain, and Ingvar Nilsson, Åkarp, Sweden, assignors to Suecia Antiqua Limited, London, England

Filed Sep. 28, 1984, Ser. No. 655,717

Int. Cl.[4] B26F *3/02;* **B26D** *1/553;* **D21F** *11/00;* **D21J** *1/02*

U.S. Cl. 493—355 **9 Claims**



1. A method of manufacturing paper sheets having a width and a length, said method comprising the steps of:

watermarking a continuous web along spaced longitudinal zones and spaced transverse zones, said transverse zones intersecting said longitudinal zones, said longitudinal zones being spaced apart according to one of said width and length, said transverse zones being spaced apart according to the other of said width and length;

drying said watermarked continuous web to provide a dried continuous web;

crushing said dried continuous web along longitudinal regions within each watermarked longitudinal zone;

crushing said dried continuous web along transverse regions coextensive of and within each watermarked transverse zone; and

tearing said dried continuous web along said crushed longitudinal regions and subsequently separating said dried continuous web along said crushed transverse regions so as to form individual paper sheets having watermarked borders and irregular edge structure.

4,601,693

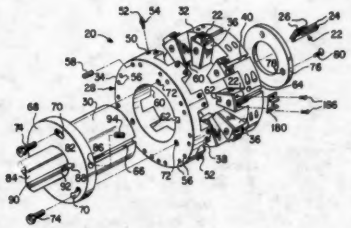
APPARATUS FOR CRIMPING A MOVING WEB

Jarold L. Richey, Dayton, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Nov. 26, 1984, Ser. No. 674,614

Int. Cl.[4] B05B *49/00*

U.S. Cl. 493—370 **4 Claims**



4. Apparatus for crimping of a moving web with a plurality of crimp blades along a line defined thereon in the direction of movement thereof, the web having a plurality of holes formed therethrough along said line, each of said holes being separated from the preceding one of said holes by a substantially uniform distance, said apparatus comprising:

a plurality of crimp blades

a holder for mounting the crimp blades including a cylindrical body having a curved outer surface;

an axial bore defined through said cylindrical body for mounting said body to a shaft, and means for securing said holder to the shaft for rotation thereby;

means for mounting the crimp blades to said body along a circumferential crimp line in predetermined fixed locations with respect to said outer surface;

an anvil including a cylindrical anvil body having a curved outer surface;

an axial bore defined through said cylindrical anvil body for mounting said anvil to a second shaft, and means for securing said anvil to the second shaft for rotation thereby;

said anvil body having at least one annular groove defined around said outer surface thereof for receiving the cutting edges of the crimp blades, counter-rotation of said holder body and said anvil body with the moving web therebetween causing insertion of each blade at least partially through the web and into said groove, and subsequent withdrawal of the blade, thereby crimping the web;

a plurality of pins;

means mounting said pins to said holder body along said circumferential crimp line so as to extend radially therefrom; and

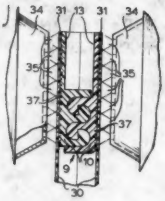
a plurality of holes defined within said anvil body through said outer surface thereof such that as said holder and said anvil are counter-rotated, each of said pins at least partially engages and subsequently disengages one of said holes;

said mounting means and said anvil body holes being located such that each of said pins further engages and subsequently disengages one of the holes of the web as it moves between said holder and said anvil.

4,601,694
THIN WALL RECLOSABLE BAG MATERIAL AND METHOD OF MAKING SAME

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,134
Int. Cl.[4] B31B *1/90;* B32B *31/20;* B65D *33/24*
U.S. Cl. 493—381 9 Claims



2. A method of making bag material for providing bags with flexible sidewalls and reclosable separable plastic profile bag mouth closure means, comprising:

advancing prefabricated thin and flexible bag sidewall sheet material continuously along an assembly path;

providing prefabricated closure strips having base portions carrying separably interlockable complementary resilient plastic profiles that are generally aligned with said base portions and the base portions provided with lateral pull flange extensions of substantially greater thickness than said sheet material extending away from said profiles from one side of each of said base portions and with the opposite side of each base portion being generally aligned with its profile;

continuously advancing said closure strips along said path and into laminar engagement with bag top mouth-opening-defining longitudinally marginal portions of said material;

continuously joining said base portions and said lateral pull flange extensions in laminar relation assembly with said marginal portions and with the distal edges of said pull flange extensions directed toward the longitudinal edges of said marginal portions;

and while said assembly continues advancing, uninterruptedly permanently securing said pull flange extensions and said base portions in said assembly with said marginal portions;

effecting said permanently securing by applying heat to and through the sheet material marginal portions in laminar engagement with said base portions and said pull flange extensions and thereby causing fusion of said marginal portions to said base portions and to said pull flange extensions; and

controlling and limiting the depth of penetration of the heat through said marginal portions into said base portions and into said pull flange extensions and thereby avoiding warpage and/or profile distortion of the permanently secured assembly.

6. Material for bags with flexible sidewalls having reclosable separable plastic profile bag mouth closure means, comprising:

flexible bag sidewall sheet material having bag top mouth-opening-defining marginal portions;

bag mouth closure means comprising strips having base portions carrying separably interlockable complementary resilient plastic profiles that are generally aligned with said base portions;

lateral pull flange extensions, of substantially greater thickness than said sheet material, extending away from one side of each of said base portions and with the opposite side of each base portion being generally aligned with its profile;

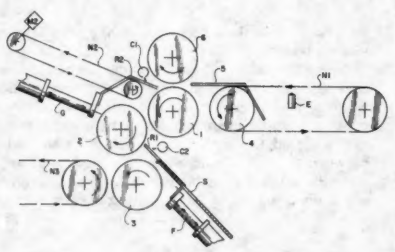
said sheet material being of less than 2 mil thickness, and said pull flange extensions being of at least 3 mil thickness;

and means comprising a heat seal permanently securing said base portions of said closure strips and said pull flange extensions in laminar relation assembly with said marginal portions of said sheet material and with the distal edges of said pull flange extensions directed toward the bag top edges of said marginal portions, so that when the bag material is formed up into bags, the bags will have laminated pull flange assemblies of a thickness which is the sum of said sheet material marginal portions and said greater thickness pull flange extensions of said closure strips and will therefore provide pull flanges which are of substantially greater than twice the thickness of said sheet material.

4,601,695
MACHINE AND METHOD FOR THE AUTOMATIC FOLDING OF CLOTHS

Fausto Pazzi, Via Rosmini, 13, 63039-San Benedetto del Tronto, Italy

Filed Apr. 6, 1984, Ser. No. 597,428
Int. Cl.[4] B65H *45/14;* B31B *7/00*
U.S. Cl. 493—418 9 Claims



1. A machine for the folding of foldable articles comprised of a first conveyor means for the moving of a foldable article on a substantially horizontal plane, a first drive means for driving the first conveyor means in one direction longitudinally thereof, a guide comb disposed at the end of the first conveyor means for receiving the foldable article therefrom, at least one first nip roller arranged on a horizontal axis positioned substantially close to the guide comb for receiving the foldable article from the guide comb and moving the article in substantially the one direction, a first retractable bridge positioned beyond the first nip roller and having an extended first position wherein the bridge is substantially close to the first nip roller, whereby the article is received from the first nip roller, and having a retracted second position wherein the bridge is substantially away from the first nip roller, a second conveyor means disposed on a substantially horizontal plane for receiving the article from the first retractable bridge when said bridge is in its extended first position, the space between the first retractable bridge in its retracted second position, the first nip roller and the second conveyor means forming a first fold gap, means for retracting the first retractable bridge away from the first nip roller whereby the foldable article falls downwards into the first fold gap, thereby forming a first fold in the article, a second nip roller arranged on a horizontal axis, beyond the first roller and below the first fold gap, whereby the first and second nip rollers grip the article for continued downward movement thereof, a second retractable bridge positioned below the first and second rollers and having an extended first position wherein it is substantially close to the second nip roller, whereby the article is received from the first and second nip rollers and is guided on the surface of the second retractable bridge in a substantially downward direction, the second retractable bridge further having a retracted second position

wherein it is substantially away from the second nip roller, a third nip roller arranged on a horizontal axis and positioned substantially below the second nip roller and the second retractable bridge, the third nip roller, the second retractable bridge in its retracted second postion and the second nip roller forming therebetween a second fold gap, means for retracting the second retractable bridge away from the second nip roller, whereby the folded article is received in the second fold gap and is gripped by the second and third nip rollers and moved in a substantially horizontal direction, thereby forming a second fold in the article; and a third conveyor means for receiving the article therefrom and moving the article on a substantially horizontal plane disposed substantially close to the third nip roller and driven in the one direction longitudinally thereof by the first drive means, whereby the article is removed from the machine.

4,601,696

CENTRIFUGE PROVIDED WITH A ROTOR IDENTIFICATION

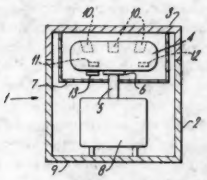
Kevin L. Kamm, Marlow Bottom, England, assignor to Fisons plc, Ipswich, England

Filed Sep. 10, 1984, Ser. No. 648,681

Claims priority, application United Kingdom, Sep. 17, 1983, 8324912

Int. Cl.[4] B04B *15/00*

U.S. Cl. 494—10 **8 Claims**



1. A centrifuge provided with a rotor identification system characterised in that the rotor identification system includes a rotor having a pair of detectable elements spaced by an angular separation characteristic of the rotor, detector means positioned so as to interact with the detectable elements to generate a signal which is a function of the angular separation, means responsive to the signal to identify the rotor, and wherein the detectable elements are distinguishable and the angular separation of the detectable elements is from 60° to 300°.

4,601,697

LONG INDWELLING DOUBLE BORE CATHETER

Joseph Mammolenti, Granger, and Bruce J. Oberhardt, Mishawaka, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

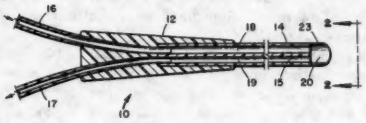
Continuation of Ser. No. 437,880, Oct. 29, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 679,447

Int. Cl.[4] A61M *3/00*

U.S. Cl. 604—43 **1 Claim**

1. A long indwelling side-by-side double bore catheter for dilution and sampling of body fluid on a continuing basis for a long period of time, said double bore catheter having flush distal ends of the side-by-side double bores and consisting essentially of:

a small mixing chamber located at the flush distal ends of said side-by-side double bores, wherein the mixing chamber has a rounded end and a noncircular opening which communicates with the body fluid to be sampled, said opening having a cross-sectional area equal to or less than twice the combined cross-sectional areas of the side-by-side double bores, and wherein the length of the mixing chamber from the flush



distal ends of the double bores to the end of the catheter is equal to or greater than 0.07 inch and the volume of said mixing chamber is between about 3 and about 9 times 10^{-5} cubic inches.

4,601,698

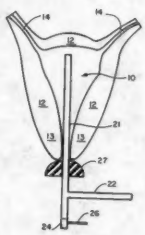
METHOD OF AND INSTRUMENT FOR INJECTING A FLUID INTO A UTERINE CAVITY AND FOR DISPERSING THE FLUID INTO THE FALLOPIAN TUBES

Thomas S. Moulding, Jr., 109 Via El Chico, Redondo Beach, Calif. 90277

Filed Sep. 17, 1984, Ser. No. 651,297

Int. Cl.[4] A61B *19/00*

U.S. Cl. 604—55 **16 Claims**



1. An instrument for injecting a fluid into a uterine cavity and for dispersing the fluid into the fallopian tubes comprising:

a tube having an open end adapted for insertion into the uterine cavity, the interior of said tube adapted for communication with a source of fluid whereby fluid from the source of fluid may flow through said tube and into the uterine cavity; and

means for vibrating the fluid within the uterine cavity whereby the fluid is dispersed into the fallopian tubes.

4,601,699

IMPLANT DEVICE

Kenny K. Crain, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 3, 1984, Ser. No. 677,419

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—64 **4 Claims**

1. A device for subcutaneously implanting a solid pellet in an animal comprising in combination

(1) a molded plunger assembly housing of unitary construction, said housing including

(a) a first tubular section with an enlarged bore having

(i) a user-proximal rear end opening with substantially the same cross section as said enlarged bore and

(ii) an ejector rod guide positioned near the user-distal front end, and

(b) a second tubular section with a reduced bore coupled to the user-distal front end of said first tubular section;

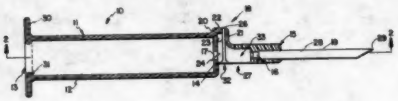
(2) a hollow needle embedded permanently in said second tubular section;

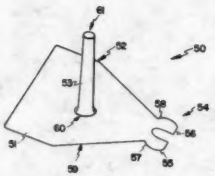
(3) a plunger assembly axially slideable in said housing, said assembly including

(a) a molded user-actuated plunger of unitary construction dimensioned for slideable movement in said enlarged bore, extending through the opening at the user-proximal rear end of said first tubular section, and

(b) an ejector rod dimensioned for slideable movement in said hollow needle and embedded permanently in the user-distal front end of said plunger, said ejector rod having a length sufficient to extend into the ejector rod guide when the plunger assembly is in its rear-most position and to extend through the hollow needle when the plunger assembly is in its forward-most position, and

(4) a socket-like cartridge receiving chamber positioned at the user-distal front end of said first tubular section and extending into said second tubular section having a flange receiving portion and a tubular receiving portion for retaining a flanged, solid pellet-containing cartridge.





2. A flanged, solid pellet-containing cartridge comprising a planar section with a substantially perpendicularly aligned tubular section extending outwardly therefrom, said tubular section having a sufficient cross-section to contain a solid pellet medicament, said planar section having an opening through which a pellet can be inserted into the tubular section and means for sealing said opening, the planar section constituting a flange for said tubular section and having a taper which terminates with a locking means, said taper facilitating insertion of the cartridge into an implant device of the type including

(1) a molded plunger assembly housing of unitary construction, said housing including

(a) a first tubular section with an enlarged bore having

(i) a user-proximal rear end opening with substantially the same cross section as said enlarged bore and

(ii) an ejector rod guide positioned near the user-distal front end, and

(b) a second tubular section with a reduced bore coupled to the user-distal front end of said first tubular section;

(2) a hollow needle embedded permanently in said second tubular section;

(3) a plunger assembly axially slideable in said housing, said assembly including

(a) a molded user-actuated plunger of unitary construction dimensioned for slideable movement in said enlarged bore, extending through the opening at the user-proximal rear end of said first tubular section, and

(b) an ejector rod dimensioned for slideable movement in said hollow needle and embedded permanently in the user-distal front end of said plunger, said ejector rod having a length sufficient to extend into the ejector rod guide when the plunger assembly is in its rear-most position and to extend through the hollow needle when the plunger assembly is in its forward-most position, and

(4) a socket-like cartridge receiving chamber positioned at the user-distal front end of said first tubular section and extending into said second tubular section having a flange receiving portion and a tubular receiving portion.

4,601,700

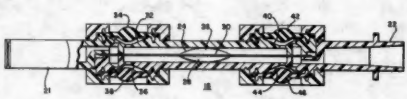
METHOD FOR FLOW CONTROL MONITORING

Thomas C. Thompson, McKinney; John A. Gula, Richardson, and Jack E. Meyer, Dallas, all of Tex., assignors to Quest Medical, Inc., Carrollton, Tex.

Filed May 21, 1984, Ser. No. 612,385

Int. Cl.[4] A61M 5/00

U.S. Cl. 604—65 **4 Claims**



1. In a gravity-driven intravenous infusion system for delivering fluid at a desired rate, employing a metering chamber separated by a movable diaphragm into two compartments, each having a valved inlet and a valved outlet, in which system pairs of valves on opposite sides of the diaphragm are alternately opened for a preselected time interval to move the diaphragm across the chamber delivering a fixed increment of fluid, said valves being switched to the alternate position only after the expiration of said time interval even if the fixed increment of fluid is delivered in a fraction of the time interval, a status monitoring method comprising:

(a) dividing each said preselected time interval into a plurality of discrete sub-intervals;

(b) at the end of each discrete sub-interval determining if the diaphragm has completed its movement across the chamber; and

(c) generating a unique perceptible signal representative of the last discrete sub-interval during which the diaphragm was moving across the chamber, whereby the user is apprised of the relative relationship of head pressure to flow resistance by the time required for diaphragm movement.

4,601,701

MULTI-PURPOSE MULTI-LUMEN CATHETER

Richard L. Mueller, Jr., Athens, Tex., assignor to Argon Medical Corp., Athens, Tex.

Filed Feb. 25, 1985, Ser. No. 705,178

Int. Cl.[4] A61M 5/00

U.S. Cl. 604—83 **3 Claims**

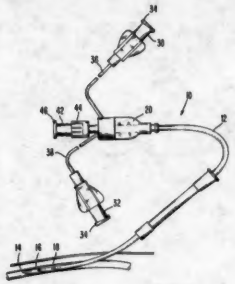
1. A multi-lumen catheter comprising:

(a) a catheter having at least two lumens which open at the distal end thereof;

(b) a hub at the proximal end of said catheter, said hub including a central mixing chamber into which the individual lumens of said catheter are connected, channel means within said hub for connecting at least one of said lumens both to said mixing chamber and to an external fluid adapter;

(c) external connecting means for connecting an external fluid transfer device to each of said channel means; and

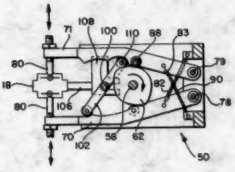
(d) means for selectively closing off said external connecting means from said central mixing chamber and for connecting said external fluid transfer device selectively to said central mixing chamber of at least one of said lumens.



4,601,702
VOLUMETRIC INFUSION ACTUATOR

James E. Hudson, Dallas, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.

Filed May 21, 1984, Ser. No. 612,384
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—246 1 Claim



1. A fluid delivery cassette actuator for a valved cassette comprising:

(a) slot means for receiving a valved cassette having exposed valve pads;

(b) valve actuator arms movable into engagement with the valve pads of a cassette located in operating position in the slot means and actuation means for automatically moving each individual arm independently into and out of engagement with its valve pad in accordance with a predetermined cycle;

(c) biasing means normally forcing all of the arms into engagement with the valve pads to close them;

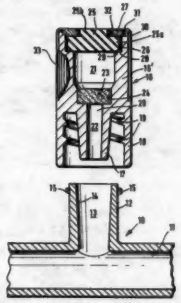
(d) eject means operable to overcome biasing means and move all arms back from the cassette, and then to push the cassette from the operating position in the slot; and

(e) insertion setup means responsive to insertion of a cassette into the operating position in the slot to automatically disable the eject means and permit the biasing means to cause the arms to engage the valve pads.

4,601,703
INJECTOR FOR AN INFUSION OR TRANSFUSION SYSTEM

Gerhard Herlitze, Baunatal, Fed. Rep. of Germany, assignor to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Dec. 20, 1984, Ser. No. 683,865
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 8402311[U]
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—86 6 Claims



1. An injector for infusion and transfusion systems, comprising:

a housing, having a first annular shoulder, an annular bead disposed on said first annular shoulder, and a duct extending longitudinally therethrough;

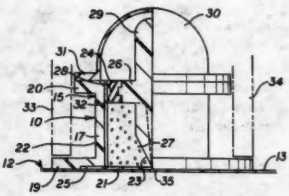
a penetrable membrane, having an inner surface with and edge, and an outer surface, said outer surface having an annular indentation on the periphery thereof, and a flat central portion bordered by said annular indentation, said inner surface covering and end of said duct, and said edge abutting said first annular shoulder and said annular bead of said housing; and

a ring, having an inner surface with an outer edge, and having an outer surface, disposed in said annular indentation of said membrane, and affixed to said housing, so that said outer surface of said ring is flush with said central portion of said outer surface of said membrane, which said ring circumscribes.

4,601,704
CONTAINER MIXING SYSTEM WITH EXTERNALLY MOUNTED DRUG CONTAINER

Mark E. Larkin, Lindenhurst, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 27, 1983, Ser. No. 546,139
Int. Cl.[4] A61J 1/00
U.S. Cl. 604—87 4 Claims



1. A container mixing system for intermixing components in a flexible intravenous solution container comprising:

a first flexible thermoplastic container including wall means

with a sterile fluid therein and including at least one administration port;

a second container for sterile fluid material having a pierceable diaphragm at one end and including a tubular sealing member, said second container secured to said first container wall means and including a resilient piston member within and in slidable contact with said tubular sealing member to vary the volume of said second container in response to external force, said resilient piston member including a piercing portion;

so that a force directed on said resilient piston member in the direction of said first container will effect both a piercing of said pierceable diaphragm and said first container wall means by said piercing portion and the removal of said second fluid material from said second container into said first container to provide fluid mixing with said first fluid material.

4,601,705

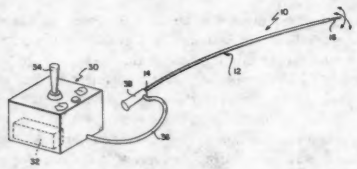
STEERABLE AND AIMABLE CATHETER

William C. McCoy, 11339 Valley Meadow Dr., Zionsville, Ind. 46077

Continuation-in-part of Ser. No. 547,402, Oct. 31, 1983, Pat. No. 4,543,090. This application May 3, 1985, Ser. No. 728,634

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—95 **15 Claims**



1. A catheter comprising

an elongated hollow tubular member having a proximal end and a distal end for insertion into the body,

a core member within the distal end of the hollow tubular member,

at least two temperature-activated memory elements within the distal end of the hollow tubular member, each memory element moving to assume a predetermined shape when heated to a predetermined temperature,

coupling means for coupling one memory element to another memory element so that when the one memory element moves in a first direction to assume its predetermined shape a force is applied to move the other memory element in the first direction and when the other memory element moves in a second direction to assume its predetermined shape a force is applied to move the one memory element in the second direction, the coupling means including sleeve means for slidably coupling each memory element to the core member so that each memory element is permitted to slip in relation to the adjacent core member when at least one of the memory elements moves to assume its predetermined shape, and

control means for selectively heating each memory element to move at least one of the memory elements to assume its predetermined shape to deflect the distal end of the tubular member in a selected direction and to slide each memory element in relation to the adjacent core member so that the memory elements are able to move in slipping relation to the distal end of the core member, whereby maneuverability of the tubular member within the body toward a selected deflected position is increased.

4,601,706

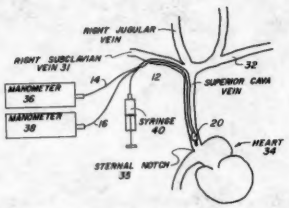
CENTRAL VENOUS PRESSURE CATHETER FOR PREVENTING AIR EMBOLISM AND METHOD OF MAKING

René Aillón, 86 Crofut St., Pittsfield, Mass. 01201

Filed Dec. 3, 1984, Ser. No. 677,519

Int. Cl.[4] A61B *5/02*

U.S. Cl. 604—122 **3 Claims**



1. A method for preventing air embolism in a patient in an upright position undergoing surgery of the head or neck comprising:

(a) inserting a central-venous-pressure multichannel catheter via a subclavian or a jugular vein just into the patient's superior cava vein so that an inflatable balloon portion of said catheter is located in said cava vein near the left artrium of the heart, a distal port and a proximal port of said catheter being spaced apart and on either side, respectively of said balloon;

(b) measuring the differential pressure between said proximal and distal ports; and

(c) inflating said balloon to partially obstruct the blood flow in said cava vein and raise said measured differential pressure to the blood manometric pressure level corresponding to the vertical distance between said distal port and the site of said surgery so that the blood pressure at the site of surgery relative to the environment is near zero.

4,601,707

INSULIN INFUSION DEVICE

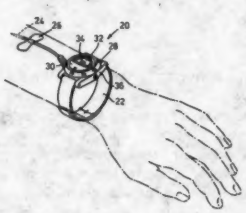
Anthony M. Albisser, 52 Wndover Road, Toronto, Ontario, M8X 2L3, and Bernard Zinman, 41 Pinnacle Road, Willowdale, Ontario, M2L 2V6, both of Canada

Filed May 22, 1981, Ser. No. 267,364

Claims priority, application Canada, Jun. 3, 1980, 353268

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—131 **8 Claims**



1. A portable device for the subcutaneous administration of liquid medicament, said device comprising:

a flexible tube for containing the entire supply of a predetermined quantity of liquid medicament to be administered during a predetermined period of operation of the device, said flexible tube being in fluid communication with catheter means for effecting subcutaneous administration of said liquid medicament;

housing means for containing said flexible tube;

roller means coupled to said housing means, said roller means cooperating with said housing means to form a nip,

said roller means and said housing means being movable relative to each other for squeezing said flexible tube in said nip for expelling said predetermined quantity of liquid medicament through said catheter means;

drive means for effecting said relative movement between said housing means and said roller means for forcing said liquid medicament out through said catheter means;

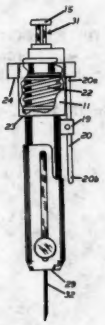
control means for operating said drive means, said medicament being expelled from said flexible tube at a rate sufficient to effect said subcutaneous administration of said liquid medicament.

4,601,708

AUTOMATIC INJECTION FOR SYRINGE NEEDLE, AND ASSEMBLY

Pavel Jordan, 1026 Brent Ave., So. Pasadena, Calif. 91030

Filed Sep. 9, 1985, Ser. No. 773,573
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—136 **9 Claims**



1. An injection device for a syringe and needle, comprising

a. an inner tube for guiding a syringe and needle assembly therethrough, the inner tube including an outer surface and providing a hammer holder mounted on the tube surface, and a hammer rotatably mounted by the hammer holder, the hammer defining a stop end, and means for securing a spring loading element disposed on said tube;

b. a spring loading element secured at one end of the tube;

c. a pipe union providing upper arms for engagement with a syringe plunger, the pipe union being slidably mounted along the outer surface of the inner tube, and attached to the inner tube by the spring element, and being upwardly biased by said spring, the pipe union extending outwardly from the tube surface to define a peripheral shoulder;

d. a stop nut mounted upwardly of the pipe union and adjacent to the upper engagement arms, and providing an outwardly extending shoulder peripherally of the outer tube surface, the stop nut being adapted for rotation to secure and release the plunger and upper arms of the pipe union; and,

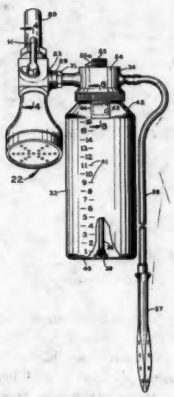
e. an outer tube surrounding a portion of the inner tube, and being adjustably mounted thereon, the outer tube defining a flat end surface for pressing against a user's body and providing a stable platform for projection of the needle therefrom; whereby: i. when the injection device is biased upwardly along the inner tube in a loaded position, the hammer at the stop end is adapted to bear against the shoulder of the pipe union and maintain the injector in the loaded position; ii. when the hammer if tripped, the union tube is released and biased downwardly by the spring, thereby projecting the attached syringe and needle in a uniform manner along the inner tube; iii. when the hammer at the stop end contacts the shoulder of the stop nut, the pipe union will be restrained from further movement; and, iv. the adjustable mounting of the outer tube along the inner tube provides a projection length of the needle beyond the flat end of the outer tube, which is uniform from injection to injection.

4,601,709

SHOWER-MOUNTED DOUCHE APPARATUS

Charles Kabbaby, 4280 S.W. 109th Ave., Davie, Fla. 33328

Filed Mar. 4, 1985, Ser. No. 707,733
Int. Cl.[4] A61M *3/00*
U.S. Cl. 604—150 **17 Claims**



1. For use with a shower apparatus having:

a water supply pipe with an outlet end;

and a shower head detachably connected to said outlet end of the water supply pipe;

a douche apparatus comprising:

a valve having a valve body with an upper end and a lower end, means on the upper end of said valve body for attaching it to said outlet end of the water supply pipe, means on the lower end of said valve body for attaching it to the shower head, a valve member in said valve body selectively adjustable between a first position in which it establishes a first water flow path from said water supply pipe to said shower head and a second position in which it blocks said first water flow path, said valve body on one side thereof having a laterally extending neck which provides a branch passage extending from said valve member to receive water from said water supply pipe in said second position of the valve member;

a container assembly for holding a liquid douche medicament;

a fitting connecting said container assembly to said laterally extending neck of said valve body for passing water from said branch passage of said valve body;

means in said container assembly for mixing said liquid medicament with the water from said fitting;

and an applicator operatively connected to said container assembly for discharging the mixture of water and said liquid medicament;

said container assembly comprising:

a mixing head coupled to said fitting and having a venturi passageway for passing water from said fitting;

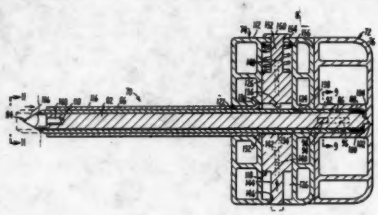
a container vessel below said mixing head; said laterally extending neck on the valve body, said fitting and said mixing head being dimensioned to position said container vessel completely to one side of the shower head;

and a siphon tube extending down into said container vessel and operatively connected at its upper end to the venturi passageway whereby the flow of water through said venturi passageway draws liquid medicament from said container vessel up through said siphon tube and into the venturi passageway in the mixing head.

4,601,710
TROCAR ASSEMBLY

Frederic H. Moll, San Francisco, Calif., assignor to Endotherapeutics Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 526,179, Aug. 24, 1983. This application Aug. 6, 1984, Ser. No. 638,048
Int. Cl.[4] A61M 5/18
U.S. Cl. 604—165 4 Claims

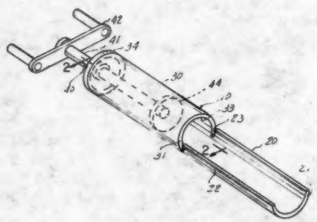


1. A trocar assembly comprising:
(a) an elongate trocar obturator having a piercing tip at its front end;
(b) and an elongate trocar tube in which the trocar obturator is housed;
(c) a tubular protective shield mounted concentrically around the trocar obturator and being axially movable relative to the trocar obturator between a normally extended position and a retracted position; and
(d) biasing means acting on the rear end of the protective shield, whereby the shield is forced to said retracted position to expose the piercing tip when the trocar is being inserted through the wall of a body cavity and is biased by said means to said extended position to shield the piercing tip once the trocar has pierced the wall.

4,601,711
SYRINGE HOLDER DEVICE FOR CONTROLLED FORCE AMPLIFICATION SYRINGE FLUID FLOW

Thomas W. Ashbury, P.O. Box 274, Flint, Mich. 48501, and Gerald J. Wadsworth, 2810 Delta River Dr., Lansing, Mich. 48906

Filed Dec. 24, 1984, Ser. No. 686,003
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—224 9 Claims

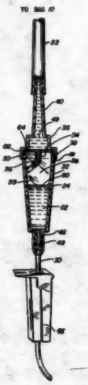


1. A syringe holder for loading with a cylindrical syringe having a syringe barrel with a unitary flange structure and for facilitating the axial advancement of the syringe barrel plunger from a retracted position to continuously advanced dispensing positions, including axially aligned barrel and plunger housing sections,
the barrel housing having the form of an open-sided open-ended part cylinder dimensioned to receive, support and stabilize the syringe barrel in coaxially mounted relation, the barrel housing comprising slot means dimensioned to receive the flange structure of a syringe barrel thus loaded into the holder and to thereby stabilize the barrel against axial dislocation with respect to the barrel housing,
the plunger housing having cylindrical form with an open end and a closed end defining an open zone dimensioned to receive the retracted plunger of the loaded syringe barrel, said closed housing end including a central aperture to accommodate insertion therethrough of a spacing bar on an axial line within the plunger housing,
and means for applying force against the head of the plunger comprising spacing bar torque means and a spacing bar having leading and trailing ends and a shank, the shank and the closed end of the plunger housing being threaded for threadably engaging the spacing bar within the central aperture such that torquing the bar achieves controlled biasing movement of the leading end of the spacing bar against the syringe plunger head located within the plunger housing.

4,601,712
DRIP CHAMBER

James E. Cole, Ventura, and Norman H. Sears, Westlake Village, both of Calif., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Nov. 16, 1983, Ser. No. 552,562
Int. Cl.[4] A61M 5/16
U.S. Cl. 604—251 1 Claim



1. A non-aerating drip chamber for use with a pressurized source of intravenous solution for precisely metering a rate of flow of intravenous solution at a low flow rate and for preventing aeration of intravenous solution at a high rate of flow of said intravenous solution, comprising: a truncated cone top cap having a first end connected in frictional engagement with an intravenous delivery line and having a second end comprising a snap collar; an intermediate member having a partition with a drip tube connected thereto, the drip tube extending downwardly from the partition and having a first section oriented substantially perpendicular to the partition and connected thereto and a second angled section connected to the first section, the partition abutting a shoulder of the top cap; and a lower truncated cone reservoir having a first end abutting the partition opposite the top cap and frictionally engaged by the snap collar of the top cap to define a closed volume whereby the second angled section of the drip tube extends downwardly into the lower truncated cone reservoir and is positioned in proximity with a sidewall of the lower truncated cone reservoir, the lower truncated cone reservoir having a tube connected thereto for carrying intravenous fluid delivered through the top cap and the drip tube out of the bottom of the drip chamber.

4,601,713
VARIABLE DIAMETER CATHETER

Clark R. Fuqua, Salem, Va., assignor to Genus Catheter Technologies, Inc., Salem, Va.

Filed Jun. 11, 1985, Ser. No. 743,705
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—280 **20 Claims**

1. A catheter adapted to be longitudinally folded for insertion into a first end of a body orifice and then unfolded after insertion for subsequently transporting a fluid, comprising:

a resiliently flexible tube of generally uniform diameter along its length, said tube having a wall of varying thickness around its circumference, such that said wall is longitudinally foldable upon itself, with that portion of said wall which folds upon itself being thinner than the rest of the wall; and

means for retaining a fold in said tube, said catheter tube having sufficient resilient memory, such that said folded tube will unfold to its normal rounded configuration upon removal or release of said retaining means.

4,601,714
VAGINAL DEVICE

Michael S. Burnhill, Rte. 24, R.D. 2, Mendham, N.J.

Continuation-in-part of Ser. No. 511,759, Jul. 7, 1983, Pat. No. 4,564,362. This application Mar. 7, 1984, Ser. No. 586,875
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—286 **26 Claims**

1. A vaginal device comprising an outermost layer of resilient compressible, open-celled, polymeric foam, a non-porous film layer formed of a liquidproof, soft elastomeric material affixed to said outermost foam layer, and a second layer of open-celled polymeric foam affixed to the opposite surface of said non-porous film layer, said outermost and innermost foam layers differing in density and/or numbers of pores per inch with the more dense or smaller pored foam layer constituting the outermost layer, said outermost layer being adapted to lie against the cervix of the uterus, said device having a diameter of about 2-2 3/5 inches and thickness of up to about 3 3/5 inches.

4,601,715
CHEST DRAINAGE DEVICE WITH SOUND MUFFLING TUBE

Daniel H. Olson, Louisville, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

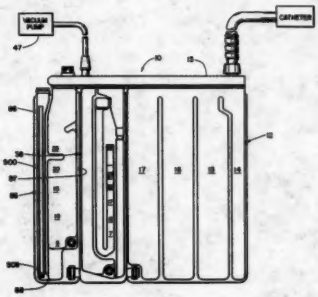
Filed May 29, 1984, Ser. No. 614,892
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—321 **6 Claims**

1. A chest drainage device for removing fluids from the pleural cavity of a patient comprising:

(a) a collection chamber adapted to be connected in fluid communication with the pleural cavity of a patient;

(b) a liquid seal chamber in fluid communication with said collection chamber; and

(c) a pressure regulation chamber in fluid communication with said seal chamber, and adapted to be connected to a source of suction; wherein said pressure regulation chamber includes a first column having an upper end including an opening to communicate with the atmosphere and a bottom end, and a second column larger than said first column having an upper end and a bottom end, and a

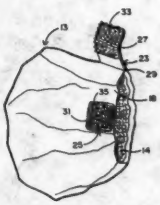


passage connecting the bottom ends of said first and second columns, said first column being bounded by a plurality of side walls, and wherein said first column further includes an elongated muffler tube inside of and extending substantially along the length of said first column, said muffler tube contacting at least one of said side walls of the first column along the length of the tube, thus creating a plurality of elongated passageways within the first column, and wherein said muffler tube has a first end and a second end, said second end being located adjacent the bottom end of the first column.

4,601,716
DISPOSABLE SANITARY SHEATH FOR MALES

Lonnie W. Smith, 1429 Palo Loma, Orange, Calif. 92669

Filed Apr. 11, 1985, Ser. No. 722,843
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—349 **20 Claims**



1. A disposable sanitary sheath, which comprises:

(a) an outer sheath having a single opening and an interior cavity;

(b) a neck with an elastic enclosure band encircling said single, large opening;

(c) an inside liner within said sheath, coextensive with said interior cavity, and formed of a moisture permeable sheet material;

(d) an intermediate pad between said outer sheath and said inside liner, coextensive with at least the central area thereof, and formed of a moisture absorbent material; and

(e) a fungicide adsorbed onto a solid water sensitive solid carrier selected from the group consisting of silica gel and aluminosilicates which are incorporated into said intermediate pad;

said sheath having a generally bag shape with a diameter from 1 to about 2 inches and a length from 1.5 to 3 inches, sufficient to be loosely received distally over a penis, with said elastic band gathering its opening to its unrestricted diameter and providing sufficient tension to retain said sheath distally about a penis.

4,601,717

DIAPER WITH FOLD POINTS

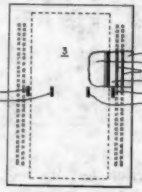
John M. Blevins, Bonn, Fed. Rep. of Germany, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 6, 1984, Ser. No. 678,620

Claims priority, application United Kingdom, Dec. 8, 1983, 8332828

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—358 A **7 Claims**



1. An absorbent structure, comprising a backsheet, absorbent core, a topsheet, and at least one elastic member along each longitudinal side of the structure, said elastic member being situated away from said absorbent core to provide flexible spacing elements; said spacing elements being folded over said absorbent core at at least one fold point and being affixed to said topsheet at at least one contact point, whereby at least one said elastic member is bent from its original configuration into a curvilinear shape, thereby providing an improved leg opening for the absorbent structure.

4,601,718

VASCULAR GRAFT AND BLOOD SUPPLY METHOD

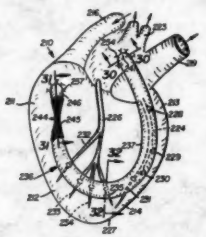
Zinon C. Possis, and Demetre M. Nicoloff, both of Edina, Minn., assignors to Possis Medical, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 489,798, Apr. 29, 1983, Pat. No. 4,562,597, which is a continuation-in-part of Ser. No. 448,955, Dec. 13, 1982, Pat. No. 4,546,499. This application Jul. 13, 1984, Ser. No. 630,838

Claims priority, application PCT Int'l Appl., Dec. 8, 1983, PCT/US83/01932

Int. Cl.[4] A61F *2/06*

U.S. Cl. 623—1 **61 Claims**



27. A graft for supplying blood to one or more blood vessels comprising: a tubular body having an inlet end adapted to be connected to means providing a supply of blood under pressure, said tubular body having a first passage open to the inlet end adapted to be provided with one or more openings which are connected to at least one blood vessel for supplying blood to said vessel, said tubular body also having a restricted second passage and an outlet end joined to said body remote from said inlet end said restricted second passage being between said one or more openings and said outlet end and acting to control the flow of blood through the first passage and sustain the pressure of blood in the first passage in order to continuously supply blood to said vessel, said outlet end having a third passage with a cross sectional area larger than the cross sectional area of said restricted second passage said third passage being open to the restricted second passage adapted to be connected to a receiver of blood having blood pressure lower than the pressure of the supply of blood thereby maintaining a continuous supply of blood to said vessel and a continuous flow of blood through said first passage, second passage and third passage into the receiver of blood.

4,601,719

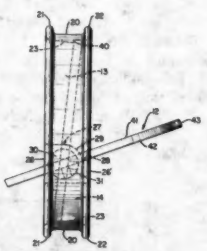
SINGLE LEAFLET VALVE

Robert P. Totten, Diamond Springs, Calif., assignor to Mitral Medical International, Inc., Denver, Colo.

Filed Feb. 3, 1984, Ser. No. 576,564

Int. Cl.[4] A61F *2/24*

U.S. Cl. 623—2 **14 Claims**

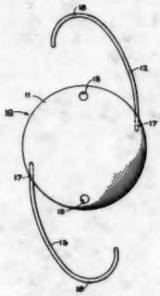


1. In an artificial heart valve comprising an annular valve body having an inner circumferential wall surface defining an orifice, and a generally flat occluder supported therein for pivotal movement about an eccentric pivot axis between an open position allowing blood flow through said orifice and a closed position preventing blood flow therethrough, the improvement comprising:

(a) a pair of pivot portions disposed on opposite sides of said inner wall surface and offset with respect to the diameter of said annular valve body, each pivot portion including a shallow concave pocket member defining an inner bearing surface having a limit stop therein, said limit stop being raised with respect to said bearing surface; and

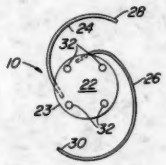
(b) occluder retaining means in the form of a pair of lateral extensions on opposite sides of said occluder, each lateral extension being convexly curved along its length for insertion into a concave pocket member for swinging movement along said bearing surface, each said lateral extension further being provided with a rib member curved in a transverse direction with respect to the plane of pivotal movement of said lateral extensions within said pocket members, said lateral extensions engageable with said limit stops to limit the pivotal opening movement of said occluder in response to blood flow through said passageway.

4,601,720
INTRAOCULAR LENS ASSEMBLY
Robert M. Sinskey, 2232 Santa Monica Blvd., Santa Monica, Calif. 90404
Filed Feb. 24, 1981, Ser. No. 236,689
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 6 Claims



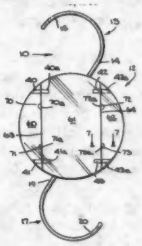
1. An intraocular lens assembly comprising in combination:
an intraocular lens for implantation in the posterior chamber of a human eye; and
first and second generally U-shaped flexible fingers carried on and projecting away from said lens in opposite directions away from each other,
each of said fingers having a continuous curve from said lens at least to the outermost portion of the finger as viewed from the front of said lens,
each of said fingers having a fixed end and a free end, with said fixed end joined to said lens and with said free end spaced from said lens,
each of said fingers having a first portion adjacent said fixed end and a second portion adjacent said free end, with said first portion of longer radius and said second portion of shorter radius, with said free end directed inward toward said lens.

4,601,721
POSTERIOR CHAMBER INTRA-OCULAR DEVICE
William Kamerling, 507 Fireside La., Cherry Hill, N.J. 08003
Filed Sep. 17, 1984, Ser. No. 651,006
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 5 Claims



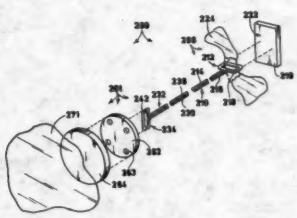
1. An intra-ocular device for implantation in the posterior chamber of an eye comprising a lens having first and second flexible loops each attached to said lens, the second loop being longer than the first loop and the free ends of said loops being approximately 180° apart so that the loops are adapted to secure the lens in the posterior chamber of an eye, and the arcuate distance between the locations at which the loops are attached to the lens being about 90° so that when the first loop is positioned in a preselected compartment in the posterior chamber of the eye at least a portion of the second loop proximal its location of attachment to the lens is also positioned in the same compartment whereby the remaining portion of the second loop can enter the compartment by rotating the lens.

4,601,722
INTRAOCULAR LENS
Charles D. Kelman, North Shore Towers, 269 Grand Central Pkwy., Bldg. 3, Floral Park, N.Y. 11005
Filed Oct. 30, 1984, Ser. No. 666,335
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 25 Claims



1. An intraocular lens comprising:
a lens body comprised of a plurality of individual portions;
magnet means on said plurality of portions for detachably connecting said plurality of portions;
whereby said plurality of portions can be individually inserted into the eye and assembled together therein into said lens body; and
position fixation means extending from said lens body and adapted to seat within an eye for fixing the position of said lens body within the eye.

4,601,723
TELESCOPING SELF-ADJUSTING OSSICULAR PROSTHESES
Robert N. McGrew, 14910 Cantrell, Little Rock, Ark. 72212
Filed Jan. 29, 1985, Ser. No. 695,835
Int. Cl.[4] A61F 2/18
U.S. Cl. 623—10 6 Claims



1. A surgically implantable, length compensating auditory ossicular prosthesis for reconstruction of the ossicles of the middle ear, said prosthesis comprising:
an oval window assembly comprising:
elongated shaft means having a base portion adapted to be surgically coupled to to the oval window in pivotal relation therewith, and an integral, cooperating shaft portion extending outwardly from said base portion away from said oval window, said shaft portion comprising a pair of elongated, closely spaced, substantially parallel shaft members, each of said shaft members being integrally joined together in loop means forming

said base portion, said loop means adapted to be sutured to at least a portion of said oval window permitting limited pivoting between said last mentioned shaft means and said oval window; and,

a cooperating tympanic membrane assembly comprising:

elongated shaft means having a base portion adapted to be surgically coupled to at least a portion of the reconstructed or original tympanic membrane in pivotal relation therewith, and a cooperating shaft portion extending outwardly from said base portion away from said tympanic membrane; said last mentioned shaft portion comprising a pair of elongated, closely spaced, substantially parallel shaft members, each of said last mentioned shaft members being integrally joined together in loop means forming said base portion of said last mentioned shaft means, said loop means adapted to be secured to at least a portion of said tympanic membrane permitting limited pivoting between said last mentioned shaft means and said tympanic membrane;

wherein said shaft portion of said oval window assembly is adapted to be frictionally, axially coupled to said shaft portion of said tympanic membrane assembly whereby to provide an axially extensible bridge between said oval window and said tympanic membrane capable of varying in length to accomodate variations in spacing between the oval window and the tympanic membrane with changes of air pressure.

4,601,724

MANUFACTURE OF TUBING ASSEMBLY FOR DRAINAGE CATHETER

Michael D. Hooven, and William S. Tremulis, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed May 29, 1984, Ser. No. 614,633

Int. Cl.[4] **A61F** *2/54;* **A61M** *5/325, 5/005*

U.S. Cl. 623—66 **25 Claims**

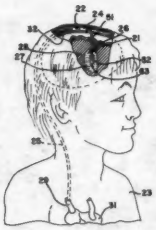
16. An implantable cerebrospinal fluid pressure relief system including a hydrocephalus pressure relief valve, draining means and a ventricular catheter, wherein the improvement comprises said ventricular catheter being made by a process including:

providing a length of elastomeric tubing having a selected outer diameter, and forming at least one radially directed opening through the elastomeric tubing;

providing a length of non-elastomeric tubing having an internal diameter substantially equal to or less than said selected outer diameter of the elastomeric tubing;

ion sputtering radially directed micro orifices through the length of non-elastomeric tubing, said ion sputtered length of non-elastomeric tubing being shorter than said elastomeric tubing length, and said ion sputtered radially directed orifices each being smaller than said radially directed opening through the length of elastomeric tubing;

stretching said length of elastomeric tubing so as to reduce its said selected outer diameter, and inserting said ion sputtered length of tubing over said length of elastomeric tubing while same is at its reduced diameter, and simultaneously generally aligning said radially directed opening of the elastomeric tubing with said ion sputtered radially directed orifices of the non-elastomeric tubing;



applying adhesive along the radially directed axial edges of the ion sputtered length of non-elastomeric tubing while the elastomeric tubing length is stretched and at its reduced diameter; and

relaxing said stretched elastomeric tubing length, whereby the elastomeric tubing substantially returns to its said selected outer diameter while the adhesive simultaneously flows between and adheres together with the ion sputtered length of non-elastomeric tubing and the elastomeric tubing in order to seal the non-elastomeric tubing over the elastomeric tubing at an orientation such that said opening through the elastomeric tubing is in substantially underlying relationship with said micro orifices of the non-elastomeric tubing.

4,601,725

THIOPHENE BASED FUGITIVE COLORANTS

Margaret S. Keller, Inman, and Edward W. Kluger, Pauline, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 27, 1984, Ser. No. 644,339
Int. Cl.[4] D06P 5/13
U.S. Cl. 8—403 11 Claims

1. A polymeric, fugitive colorant of the formula:

$$A—N{=}N—B—[(C)H]_n$$

wherein A is thiophene or a thiophene derivative, N is nitrogen, B is a nitrogen containing organic dyestuff coupling component, C is a polymer chain bound to nitrogen in the organic dyestuff coupling component; said polymer chain being selected from polyethylene oxide, polypropylene oxide, polybutylene oxide and copolymers of polyethylene oxide, polypropylene oxide, and/or polybutylene oxide, said polymer chain having about x repeating monomeric units, n is an integer from 1 to 6 and the product of n times x is from about 50 to about 250.

4,601,726

DYE COMPOSITION FOR THE DIRECT DYEING OF KERATINIC FIBRES, CONTAINING AT LEAST ONE N-SUBSTITUTED COSOLUBILIZED 2-NITROPARAPHENYLENEDIAMINE AND CORRESPONDING PROCESSES FOR DYEING KERATINIC FIBRES

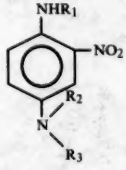
Jean-Francois Grollier, Paris; Jean Cotteret, Franconville; Andrée Bugaut, Boulogne, and Alain Genet, Neuilly Plaisance, all of France, assignors to L'Oreal, Paris, France

Filed Nov. 21, 1984, Ser. No. 673,789
Claims priority, application Luxembourg, Nov. 21, 1983, 85098
Int. Cl.[4] A61K 7/13; C09B 67/22; D06P 1/19
U.S. Cl. 8—410 21 Claims

MICROFICHE APPENDIX INCLUDED
(04181986 Microfiche, Pages)

1. A dye composition for use in the direct dyeing of keratinic fibers comprising, in a suitable vehicle,

(a) a keratinic fiber-dyeing amount of at least one direct nitro dye of the formula



(I)

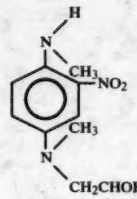
wherein

R_1 is hydrogen, alkyl having 1–4 carbon atoms or monohydroxy alkyl wherein the alkyl moiety has 2–4 carbon atoms,

R_2 is monohydroxy alkyl wherein the alkyl moiety has 2–4 carbon atoms,

R_3 is alkyl having 1–4 carbon atoms or monohydroxy alkyl wherein the alkyl moiety has 2–4 carbon atoms, or a salt thereof, and

(b) an amount effective to increase the solubility of said direct nitro dye of (a), above, in said vehicle, of a compound of the formula



(II)

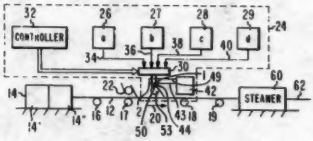
or a salt thereof.

4,601,727

TEXTILE DYEING PROCESS AND APPARATUS FOR MULTICOLOR PATTERNS

David B. Nichols, Jr., Dalton, Ga., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 13, 1984, Ser. No. 639,843
Int. Cl.[4] D06P 5/00
U.S. Cl. 8—477 9 Claims



1. A continuous textile dyeing process comprising:

moving a length of a textile web in a given forward direction;

supplying foamed dyestuffs in a sequence of alternate first and second colors to a first set of spaced nozzles and to a second set of spaced nozzles spaced from the first set;

moving the first and second sets of nozzles back and forth across the width of the web in opposite directions; and

applying the sequence of dyestuffs from the sets of nozzles to a surface of the forward moving textile with the dyestuffs from one set being superimposed over the dyestuffs of the other set;

the spacing of the nozzles and the applied first and second colors and the distance the nozzles move across the web being such that repeating spaced patterns of substantially only the first color and of substantially only the second color are produced on the textile surface having a background region containing the first and second colors, each pattern of a given color being produced by dyestuffs from both sets of nozzles.

4,601,728

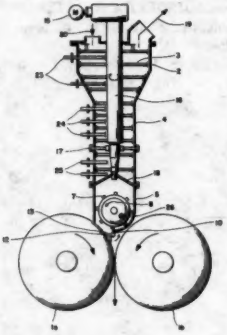
METHOD AND APPARATUS FOR PREPARING A MATERIAL FOR HOT BRIQUETTING

Horst Dungs, Herne; Franz Beckmann, Aachen, both of Fed. Rep. of Germany, and Henri Birscheidt, Lintgen, Luxembourg, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

PCT No. PCT/EP84/00266, § 371 Date Apr. 30, 1985, § 102(e) Date Apr. 30, 1985, PCT Pub. No. WO85/01061, PCT Pub. Date Mar. 14, 1985
PCT Filed Sep. 4, 1984, Ser. No. 732,757
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332053
Int. Cl.[4] C10L 5/06; B30B 11/00
U.S. Cl. 44—10 G 12 Claims

1. A method of preparing a material for hot briquetting

through pyrolytic decomposition of bituminous coals in mixture with a two to five times larger volume of fine grained, thermally widely stable substances including at least one of anthracite, lean coal, coil coke, coke dust, sand, ores, phosphates, and fine-grained metal oxides, which do not bake below 650° C. and only unsubstantially soften, if not all, at a temperature between about 450° to 530° C. which has been adjusted by mixing the bituminous coal predried and preheated to the temperature at which it starts softening, with the thermally widely stable substances having a correspondingly higher initial temperature, comprising distributing the briquetting material over the width of a double-roll press and subsequently forming it in molds, characterized in that the briquetting material forming through pyrolytic decomposition of the bituminous coal component in the mixture is kept in a traveling bed reactor in a continuous mixing and kneading motion, ini-



tially in a rotational mixing and kneading motion taking place predominantly at levels parallel to the plane of the axes of rolls of the double-roll press, during which motion the material gradually sinks under gravity at an average speed of less than 3 centimeters per second, and toward the end in a rotational motion taking place almost perpendicularly thereto, by which it is uniformly spread over the entire width of the rolls.

7. An apparatus for carrying out the method according to claim 1, including a traveling bed reactor comprising a vessel in which at least one stirring mechanism is mounted having a vertical axis of rotation and horizontal stirring arms, and a distributor zone is provided below which is formed a cylindrical distributor cage having a central horizontal axis, characterized in that in the upper region (2), the horizontally rotating stirring arms (3) are about 1.5 to 5 times longer than the stirring arms in the lower region (4).

4,601,729

AQUEOUS PHASE CONTINUOUS, COAL FUEL SLURRY AND A METHOD OF ITS PRODUCTION

Charles E. Capes; Adam J. Bennett, both of Ottawa; Richard D. Coleman, Orleans, and William L. Thayer, Ottawa, all of Canada, assignors to Canadian Patents and Development, Ltd., Ontario, Canada

Filed Oct. 1, 1984, Ser. No. 656,675
Claims priority, application Canada, Oct. 12, 1983, 438782
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 **3 Claims**

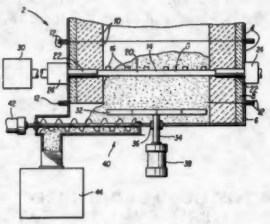
1. An aqueous phase continuous, coal fuel slurry, containing oil bridged flocs of de-ashed, carbonaceous particles derived from an oil agglomeration thereof and having residual agglomerating oil associated therewith, water, at least one coal/oil/water agglomerate dispersing and coal/oil/water system interfacial tensions reducing agent selected from the group consisting of alcohols and surfactants, wherein said oil bridged flocs function to limit any packing down of the slurry to a porous, easily remixed bed, and wherein the residual oil content of said flocs is no greater than 10 wt.% of the solids content of the slurry, the solids content of the slurry is in the range of the order of 50 wt.% to of the order of 80 wt.% of the total weight of the slurry and the slurry contains at least 0.5 wt.% of said surfactant and/or at least 2.6 wt % of said alcohols.

4,601,730

AIR SUPPLY GRATE AND ASH REMOVAL SYSTEM FOR WOOD GASIFIER

Thomas F. McGowan, Atlanta; R. Lynnard Tessner, Elberton; Robert A. Cassanova, Tucker, and William S. Bulpitt, Atlanta, all of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 408,199, Aug. 16, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,641
Int. Cl.[4] C10J *3/34, 3/42*
U.S. Cl. 48—76 **14 Claims**



1. In a solid fuel gasifier, a reactor vessel containing a fixed bed of fuel and ash supported by the floor of the vessel and the hot ash moving downwardly toward said floor during the operation of the gasifier, an air supply grid including a plurality of spaced parallel grid tubes spanning the interior of the reactor vessel at an elevation above said floor and being substantially within the hot ash of said fixed bed, the opposite ends of the grid tubes being supported by the side wall of the reactor vessel and being rotationally and axially adjustable, the spacing of the grid tubes being such that their collective horizontal surface area equals less than one-third of the horizontal surface area across the reactor vessel chamber, whereby the grid tubes offer little resistance to the downward movement of ash in the reactor vessel, and cooperative ash removal means within the reactor vessel chamber near said floor and below the air supply grid, said ash removal means including an ash plow operating within the reactor vessel chamber near and above said floor and an ash extraction auger below said ash plow and near said floor, said auger being in communication with said chamber.

4,601,731

CHEVRON-TYPE MIST ELIMINATOR AND METHOD

Ilya Michelson, Brookline, Mass., assignor to Koch Engineering Company, Inc., Wichita, Kans.

Filed Jul. 2, 1985, Ser. No. 751,149
Int. Cl.[4] B01D *45/08*
U.S. Cl. 55—1 **11 Claims**

9. A method for removing liquid from a mist-rich gas stream, which method comprises:

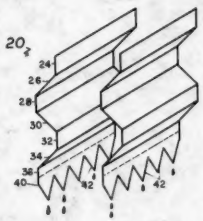
(a) introducing a mist-rich gas stream into the lower portion of a column for upward flow through the column;

(b) withdrawing a mist-lean gas stream from the upper portion of the column;

(c) withdrawing liquid coalesced from the mist-rich gas stream from a lower portion of the column; and

(d) passing the mist-rich gas stream through an upwardly flowing tortuous flow path defined by a mist-eliminator layer composed of a plurality of substantially vertical, parallel, spaced-apart, serpentine baffles, the baffles having a leading upstream edge to the upwardly flowing gas stream, the baffles providing for a tortuous gas flow path

of the mist-rich gas stream, the baffles having a surface for the impingement of the mist-rich gas stream on the baffle surface, to provide for coalescing of the liquid from the mist-rich gas stream, and the baffles having a plurality of downwardly projecting drainage points on the leading



upstream edge of the baffles, to promote the rapid drainage of coalesced liquid from the baffle surface, thereby increasing the critical gas velocity of the upwardly flowing stream and preventing reentrainment into the mist-lean gas stream of the coalesced liquid from the baffle surface.

4,601,732

APPARATUS FOR RECOVERING DILUTE SPECIES IN A FLUID STREAM

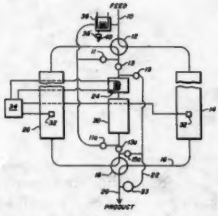
Michael D. Oliker, Amesbury, Mass., assignor to Near Equilibrium Research Associates, Amesbury, Mass.

Continuation of Ser. No. 484,184, Apr. 12, 1983, abandoned, and a continuation-in-part of Ser. No. 361,134, Mar. 24, 1982, which is a division of Ser. No. 166,054, Jul. 7, 1980, Pat. No. 4,324,564.

This application Nov. 28, 1984, Ser. No. 675,466

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—20 **16 Claims**



1. A method of treating a fluid feed stream containing a mixture of dilute sorbates to obtain a plurality of separate fractions each of which is rich in a selected one of said sorbates, said method comprising the steps of:

A. passing said fluid stream through a main bed containing a sorbent material to load said sorbates onto said sorbent material in a series of zones rich in a selected one of said sorbates;

B. passing a hot regenerant fluid through said main bed countercurrent to said fluid feed stream so as to produce slow desorotion front in said bed;

C. passing a cooling gas stream through said main bed cocurrent to said hot regenerant stream to produce a fast cooling front in said bed, said cooling gas stream being introduced into said bed prior to the time said desorption front leaves the bed;

D. passing effluent exiting said bed during step C through a second bed containing sorbent material; and

E. collecting separate sorbate fractions rich in a selected one of said sorbates from effluent exiting said second bed in means for collecting said sorbate fractions.

12. A method of treating a natural gas stream containing a mixture of dilute sorbates to obtain a plurality of separate fractions each of which is rich in a selected one of said sorbates, said method comprising the steps of:

A. passing said natural gas stream through a main bed containing a sorbent material to load said sorbates onto said sorbent material in a series of zones rich in a selected one of said sorbates;

B. recirculating a hot regenerant fluid through said main bed countercurrent to said natural gas stream so as to produce a slow desorption front in said bed;

C. passing a cooling gas stream through said main bed cocurrent to said hot regenerant stream to produce a fast cooling front in said bed, said cooling gas stream being introduced into said bed prior to the time said desorption front leaves the bed;

D. passing effluent exiting said main bed during step C through a second bed containing sorbent material; and

E. collecting separate sorbate fractions rich in a selected one of said sorbates from effluent exiting said second bed in means for collecting said separate sorbate fractions ccmprising a condenser.

4,601,733

HIGH VOLTAGE GENERATOR FOR AN ELECTROSTATIC DUST PRECIPITATOR

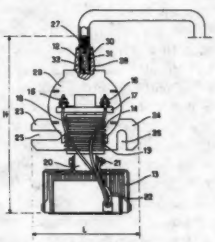
Jean-Pierre Ordines, Clamart; Dominique Bacot, 31, Quai Anatole France, 75007 Paris, and Jean-Michel Detroyat, 14, rue de Condé , 75006 Paris, all of France, assignors to Dominique Bacot and Jean-Michel Detroyat, both of Paris, France

Filed Sep. 27, 1984, Ser. No. 654,944

Claims priority, application France, Sep. 29, 1983, 83 15565

Int. Cl.[4] B03C *3/02;* **H02M** *3/35, 1/00;* **H65K** *7/02*

U.S. Cl. 55—139 **12 Claims**



1. A high voltage generator for an electrostatic dust precipitator having metal surfaces in opposed insulated relation to each other to provide a passage for fluid from which dust is to be removed, said high voltage generator comprising, a low voltage oscillator having an output, a current chopper having an input connected to the output of the low voltage oscillator, said current chopper having an output, an induction coil comprising a primary winding connected to the output of the chopper, and a secondary winding connected to at least one of the metal surfaces of the dust precipitator by a high voltage diode, so that a high potential difference from the secondary winding is produced across the opposed metal surfaces of the dust precipitator, and wherein, said high voltage generator further comprises a removeable assembly having a lower housing containing said low voltage oscillator and current chopper, said assembly further comprising a portion with the induction coil attached thereto connected above said lower housing, and a high voltage connection in the form of a substantially cylindrical extension on the side of the assembly portion opposite said lower housing, said extension containing a removable hollow plug which supports the diode therein, and a high voltage connection plug connected to said diode at a location externally of the removeable hollow plug.

4,601,734
ARRANGEMENT FOR THE REMOVAL OF DUST FROM GAS STANDING UNDER PRESSURE

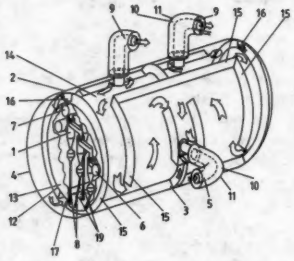
Hans-Joachim Meier, Wesel, and Joachim Secker, Oberhausen, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,648

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410143

Int. Cl.⁴ B01D *53/24*

U.S. Cl. 55—269 **11 Claims**



1. Apparatus for the removal of dust from gas which is standing under pressure, has been generated in a pressure-charged fluidized bed furnace, and is conducted to a gas turbine comprising: cyclones arranged in a plurality of stages one behind the other and connected in stage by stage; a pressure vessel separated from the fluidized bed furnace for housing said cyclones; at least one feed pipe standing under pressure, and a distributor duct; a collecting duct and a discharge pipe, said cyclones having a gas entry side connected with the fluidized bed furnace through said feed pipe standing under pressure and said distributor duct; said cyclones having a gas exit side connected to said collecting duct and said discharge pipe; said feed pipe and said discharge pipe being located on a part lying externally of said pressure vessel; an outer pipe surrounding said feed pipe and said discharge pipe and forming an annular space; said annular space having a connection with interior space of said pressure vessel for connection with a compressor associated with the gas turbine; said pressure vessel comprising a double-walled vessel with interior and intermediate space between walls placed separately under pressure; said feed pipe and said discharge pipe being surrounded by annular spaces connected to the interior of said pressure vessel and said compressor, air flowing from said compressor to said pressure vessel for placing said pressure vessel under predetermined pressure.

4,601,735
VACUUM BAG ATTACHMENT DEVICE

William J. Morton, Jr., Lindhurst, Ohio, assignor to Royal Appliance Mfg. Co., Cleveland, Ohio

Filed Jan. 18, 1985, Ser. No. 692,708

Int. Cl.⁴ B01D *46/02*

U.S. Cl. 55—377 **6 Claims**

1. A vacuum bag attachment device which includes a vacuum bag;

a vacuum assembly having a generally circular opening therefrom;

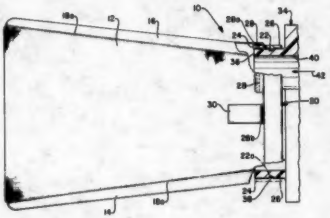
a generally circular mounting flange defining the circular opening which is characterized by the flange having an endless recess therein;

an endless elastic band having a raised internal rib adapted to be complimentarily and resiliently engaged into the recess of the mounting flange when the band is stretched around the flange;

means to secure the bag to the band; and

means attached to the bag and band to assist in manually moving the band onto or off of the flange; and

wherein said vacuum bag is attached to the elastic band on



the external surface thereof and is folded in on itself where the folded-in portion is the attached portion; and

wherein said means attached to the bag and band is a looped pull tab that is sewn to the cut edge of the vacuum bag and extends back in looped fashion from the edge.

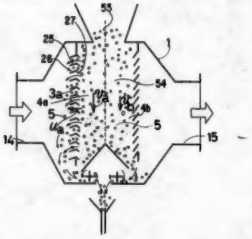
4,601,736
DYNAMIC GAS FILTER APPARATUS

Keiji Fijiwara, Kyoto; Takaaki Shinoda; Shigehiro Kitou, both of Hyogo, and Suenobu Kawabe, Osaka, all of Japan, assignors to Kabushikigaisha Takuma, Osaka, Japan

Filed Nov. 6, 1984, Ser. No. 668,846

Int. Cl.⁴ B01D *33/18*

U.S. Cl. 55—479 **7 Claims**



1. An apparatus for filtering dust from a gas, comprising:

a housing having a gas inlet, a gas outlet, and a bottom;

an inflow screen for receiving inflow gas from said gas inlet;

an outflow screen through which said gas passes as it flows toward said gas outlet;

a gas treatment region located within said housing;

a quantity of granular filter medium traversing said gas treatment region for removing dust from the gas;

filter medium discharge means installed at the bottom of said gas treatment region;

cleaning means for cleaning said granular filter medium and for returning the cleaned filter medium to said gas treatment region;

said inflow screen being operative to selectively cause a portion of said granular filter medium to overflow towards said gas inlet in a direction having a directional component antiparallel to the direction of gas inflow;

said inflow screen including a plurality of louvers located above each other, each louver including an inlet slanting plate having first and second ends and an outlet slanting plate having first and second ends, said second end of each of said outlet slanting plates being joined to a first end of an inlet slanting plate to form an obtuse angle therebetween;

said inlet slanting plates being directed downwardly from

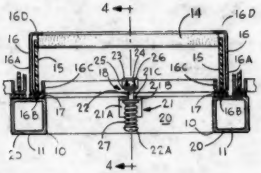
the horizontal at an angle so that said first end thereof is above the static drain-angle-slant-line of said inflow screen, but below the dynamic drain-angle-slant-line of said inflow screen whereby said granular filter medium overflows said inlet slanting plate towards said gas inlet when said granular filter medium is discharged from said discharge means, but does not overflow said inlet slanting plate when said granular filter medium is not discharged from said discharge means.

4,601,737

AIR FILTER SYSTEM FOR CLEAN ROOM

Fred T. Gerbig, 2990 Brenner St., Roseville, Minn. 55113

Filed Dec. 17, 1984, Ser. No. 682,325
Int. Cl.[4] B01D *46/44*
U.S. Cl. 55—493 **10 Claims**



1. For filtering air entering a room from a pressurized plenum above:

(a) filter media sealingly enclosed around its edges in a rectangular casing located under said pressurized plenum;

(b) a rigid outer frame around said filter media casing having vertical side walls, a horizontal flat rim extending inwardly from the bottom edge of said side walls, and a vertical flange extending upwardly from the inner edge of said rim;

(c) a gasket comprising a strip of resilient sealing material attached to and entirely covering the outside of said rim;

(d) a rectangular support frame made of rigid channel bars, said gasket covered rim of said filter frame resting on top of said support frame with said filter media covering over the entire opening defined by said support frame; and

(e) clamp means attached to said support frame for engaging said frame flange for adjustably and releasably holding said gasket covered rim in airtight engagement against said support frame.

4,601,738

PROCESS FOR FREEZE PROTECTION AND PURIFICATION OF NATURAL GAS LIQUID PRODUCT STREAMS PRODUCED BY THE MEHRA PROCESS

Yuv R. Mehra, Odessa, Tex., assignor to El Paso Hydrocarbons Company, Odessa, Tex.

Continuation-in-part of Ser. No. 637,210, Aug. 3, 1984, Pat. No. 4,578,094, which is a continuation-in-part of Ser. No. 532,005, Sep. 14, 1983, Pat. No. 4,526,594, which is a continuation-in-part of Ser. No. 507,564, Jun. 24, 1983, Pat. No. 4,511,381, which is a continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535. This application Jul. 24, 1985, Ser. No. 758,351
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—17 **21 Claims**

1. In a continuous process for producing a liquid hydrocarbon product having a selected composition, that is selectively adjustable to substantially any selected degree in accordance with market conditions, and a residue natural gas stream of pipeline quality, that selectively includes ethane (C_2), propane (C_3), and butane (C_4), by extraction of an inlet natural gas stream with a stream of a physical solvent to produce a rich solvent stream in addition to said residue natural gas stream, said rich solvent stream being flashed to at least atmospheric pressure to produce:

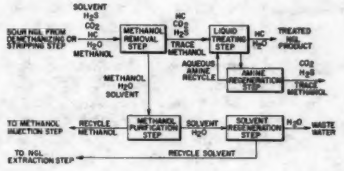
(a) stream of flashed gases which are compressed, cooled, and condensed for demethanizing to produce a selected stream of C_1–C_4 rejected gases and a natural gas liquid product, and

(b) a recycle solvent stream that is split into a major solvent stream and a solvent slipstream which is regenerated to form a lean-and-dry solvent stream for recycling to said extraction, wherein needs exist for:

(i) removing resiudal water from flashed gases before the hydrate temperature is reached after compressing and cooling thereof,

(ii) removing residual solvent from said natural gas liquid product, so that said solvent will not act as a gumming compound when a natural gasoline fraction of said natural gas liquid product is used for motor fuel, and

(iii) sweetening said natural gas liquid product when sour natural gas has been given merely a rough wash selec-



tively to remove H_2S to prepare said natural gas for said continuous process,

an improvement which comprises preventing the formation of hydrates within said flashed gases and removing water, residual solvent, and traces of acidic components from said natural gas liquid product by the following steps:

A. adding methanol to said stream of flashed gases, prior to achieving the temperature for hydrate formation;

B. after said demethanizing, separating the mixture of a methanol/water/solvent solution and a natural gas liquid product into two phases, the lower phase being said solution of methanol, water and solvent;

C. removing said lower phase and fractionating said solution to recover said methanol overhead and a stream of water and solvent; and

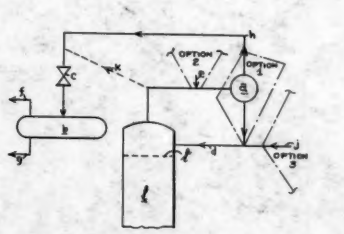
D. recycling said recovered methanol to said stream of flashed gases in said step A.

4,601,739

PROCESS FOR FRACTIONAL DISTILLATION

Michael J. Dolan, Brecksville, Ohio, assignor to Norton Company, Worcester, Mass.

Filed Aug. 30, 1984, Ser. No. 645,658
Int. Cl.[4] B01D *3/34;* F25J *3/02*
U.S. Cl. 62—20 **11 Claims**



1. In a process for the efficient continuous separation of a more volatile constituent A from at least one less volatile constituent B with which it is mixed, said process comprising:

(a) introducing a liquid mixture comprising components A

and B into the central section of a continuous fractional distillation column;

(b) supplying sufficient heat to the bottom section of said fractional distillation column to generate at the top section of said fractional distillation column a gaseous mixture in which the ratio of the content of component A to the content of component B is greater than in the said liquid mixture of part (a);

(c) contacting said gaseous mixture of part (b) with condenser surfaces maintained, by refrigeration means capable of supplying refrigerant only at temperatures higher than the temperature required to condense the entire volume of said gaseous mixture of part (b), at a temperature sufficiently low so as to cause the condensation of at least part of said gaseous mixture;

(d) returning as liquid reflux to the top section of said fractional distillation column the condensate liquid produced by the operation of part (c); and

(e) separately collecting as outputs (i) the off-gas remaining uncondensed after the operation of part (c) and (ii) liquid from the bottom section of said fractional distillation column in amounts together sufficient in mass to equal the mass of liquid input by operation of part (a),

the improvement of precluding the requirement to install new refrigeration capacity due to fitting said continuous fractional distillation column with new packing or increasing the reflux ratio of operation of said column, said improvement comprising:

(f) admixing with the liquid reflux of part (d) an auxiliary material C independent of the input of part (a) and having a higher condensation temperature than said component A; and

(g) collecting gas and liquid outputs as recited in part (e) in amounts together sufficient in mass to equal the sum of the input mass of part (a) and the mass of admixed component C,

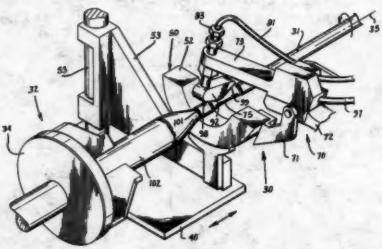
whereby the fraction of component B in the output gas of part (e) is less at any given temperature of condenser surfaces than would be obtained from the same input liquid composition with said fractional distillation column in the absence of an admixing of auxiliary material.

4,601,740

METHODS OF AND APPARATUS FOR AT LEAST PARTIALLY CLOSING AN END PORTION OF AN OPTICAL PREFORM TUBE

Brian Lynch, Norcross, and William D. O'Brien, Jr., Lilburn, both of Ga., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 18, 1984, Ser. No. 682,975
Int. Cl.[4] C03B *37/025*
U.S. Cl. 65—2 **12 Claims**



1. A method of at least partially closing a portion of a preform tube prior to collapsing the tube into a preform from which optical fiber is drawn, the method including the steps of:

supporting the preform tube for rotation about a longitudinal axis of the tube;

turning rotatably the tube about the longitudinal axis; while

subjecting a portion of the tube, as it is being turned rotatably, to a static zone of heat which is generally symmetrical about a predetermined maximum temperature thereof; and

controllably engaging in a reproducible manner the portion of the tube with a contact device at the maximum temperature portion of the static zone of heat to cause the portion of the preform tube to become at least partially closed; while

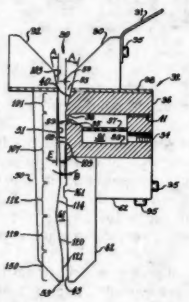
providing a cooling medium to a location within the contact device.

4,601,741

METHOD AND APPARATUS FOR PRODUCING A CONTINUOUS GLASS FILAMENT MAT

David V. Stotler, and Fred S. Coffey, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 8, 1985, Ser. No. 721,019
Int. Cl.[4] C03B *37/06*
U.S. Cl. 65—4.4 **5 Claims**



5. A method of producing a mat of continuous glass filaments comprising:

supplying a plurality of streams of molten glass from a feeder means;

drawing the streams into said filaments;

orienting said bundles as a planar band;

passing said planar band through a distribution means having (a) an inlet adapted to receive said plurality of filaments arranged as a substantially planar band of bundles of filaments, said inlet being oriented substantially parallel to the axis of rotation of the pull roll, (b) a blower section adapted to supply a substantially planar high velocity gaseous stream to contact said bundles, (c) a first control surface extending from said blower section, (d) a second control surface opposite said first control surface, and (e) a projection extending into an after-defined divergent section for creating turbulent flow of said gaseous stream within the distribution means to disassociate the bundles of filaments, said first and second control surfaces and said blower section forming (a) a throat section to receive said planar gaseous stream from said blower section; (b) a divergent section extending from said throat section; and (c) a convergent section extending from said divergent section, said divergent section and convergent section being oriented to (i) reduce the velocity of the gaseous stream and advancing filaments and (ii) impart lateral movement to some of the gaseous streams and filaments to advance said filaments as a diverging planar array having a width at said collection surface at least about 4 times the width of the band of filaments entering said inlet;

means for moving said distribution means to deposit the array filaments discharged from distribution means across the width of the mat being formed; and

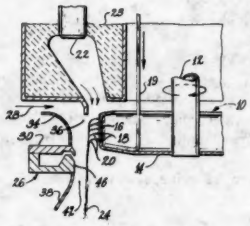
collecting the filaments as said mat.

4,601,742

BLOWER FOR MINERAL FIBERIZER

Farrokh Kaveh, Dublin, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 22, 1985, Ser. No. 725,738
Int. Cl.[4] C03B *37/04*
U.S. Cl. 65—14 **3 Claims**



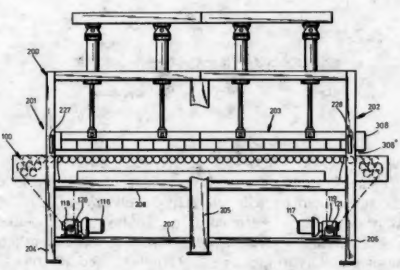
1. Apparatus for producing mineral fibers comprising a spinner mounted for rotation to centrifuge mineral fibers from molten mineral material, an annular blower positioned concentrically outwardly from said spinner for turning the mineral fibers downward and inducing a downward flow of air around said spinner, the outlet of said blower being positioned at a level beneath said spinner, and an airfoil mounted above said blower to provide a downwardly converging annular passageway above the level of said blower for the induced air, said blower and said airfoil forming a substantially continuous curved surface, being curved radially inwardly at the blower.

4,601,743

GLASS FURNACE WITH HEAT SENSING MEANS

Douglas M. Canfield, Suffern, N.Y., assignor to Casso Solar Corporation, Pomona, N.Y.

Continuation-in-part of Ser. No. 531,906, Sep. 12, 1983, Pat. No. 4,528,016. This application May 2, 1985, Ser. No. 729,680
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.[4] C03B *27/00*
U.S. Cl. 65—162 **20 Claims**



1. A furnace for the heat treatment of glass including, annealing, heat-strengthening, tempering and bending of glass which comprises:

a housing defining an elongated furnace chamber having an inlet and an outlet;

a roller conveyor between said inlet and said outlet and including a row of stub rollers disposed along each side of said housing flanking a path between said inlet and said outlet, a drive conveyor belt extending over and under alternate stub rollers on one side of said conveyor, and fused silica support rollers spanning said conveyor with each support roller resting upon two stub rollers overshot by said belt;

means for driving said belt to oscillate glass articles carried by said support rollers back and forth in said housing;

an array of infrared heaters mounted in said housing above said conveyor; and

a computer for displaying parameters for the operation of said heaters in a pattern on a screen corresponding to said array.

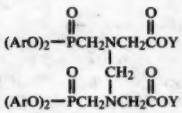
4,601,744

ESTERS OF N,N'-METHYLENE-BIS-[N-[(DIARYLOXYPHOSPHINYL)METHYL]GLYCINE] AS HERBICIDES

James A. Sikorski, Kirkwood; Deborah Mischke, Creve Coeur, and Gerard A. Dutra, Ladue, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 5, 1985, Ser. No. 698,484
Int. Cl.[4] A01N *57/06*; C07F *9/40*
U.S. Cl. 671—86 **15 Claims**

1. A method of controlling undesired plants which comprises applying to said plants a herbicidally effective amount of a compound of the formula



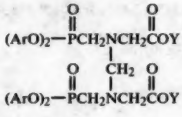
(IV)

wherein

Ar is a member of the group consisting of phenyl or phenyl substituted with 1 or 2 groups independently selected from the class consisting of halogen, lower alkyl, and lower alkoxy; and

Y is lower alkyl or aralower alkyl.

6. A compound represented by the formula



(IV)

wherein

Ar is a member of the group consisting of phenyl or phenyl substituted with 1 or 2 groups independently selected from the class consisting of halogen, lower alkyl, and lower alkoxy; and

Y is lower alkyl or aralower alkyl.

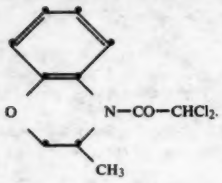
4,601,745

COMPOSITION FOR THE PROTECTION OF CULTIVATED PLANTS AGAINST THE PHYTOTOXIC ACTION OF HERBICIDES

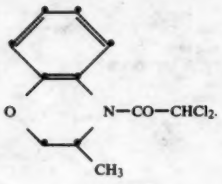
Hans Moser, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 560,466, Dec. 12, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 713,093
Int. Cl.[4] A01N *43/84*; C07D *265/28*
U.S. Cl. 71—88 **3 Claims**

1. A process for selectively controlling weeds in crops of useful plants, which comprises treating the cultivated plants or the area on which they are cultivated with both a halogenoacetanilide herbicide and an effective amount of 4-dichloroacetyl-2,3-dihydro-3-methyl-1,4-benzoxazine of the formula



3. The seed of useful plants which has been treated with an amount having an antagonistic action of 4-dichloroacetyl-2,3-dihydro-3-methyl-1,4-benzoxazine of the formula



4,601,746

SUBSTITUTED SULFONYLUREA, PROCESSES FOR THE PRODUCTION OF THESE COMPOUNDS, AS WELL AS COMPOSITIONS CONTAINING THE SAME AND HAVING HERBICIDAL AND PLANT GROWTH REGULATING ACTIVITY

Jürgen Westermann; Gerhard Boroschewski; Ulrich Eder; Friedrich Arndt; Hansjörg Krähmer, and Clemens Kötter, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

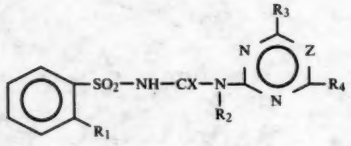
Filed Jun. 18, 1984, Ser. No. 623,134

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3322280

Int. Cl.[4] C07D *239/46;* A01N *47/36*

U.S. Cl. 71—92 **17 Claims**

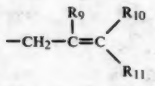
1. Sulfonyl urea of the formula



in which

R_1 is chlorine, $-COOR_5$, $-S(O)_n-R_6$ or

R_2 is



or $-CH_2-C\equiv C-R_{11}$,

R_3 is hydrogen, C_1–C_4-alkyl, C_1–C_4- alkylthio, halogen, halogen-C_1–C_4-alkyl, halogen-C_1–C_4-alkoxy, Di-C_1–C_3-alkyl-amino, C_1–C_3-alkyl-amino or C_1–C_3-alkoxy-C_1–C_3-alkoxy,

R_4 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-aklylthio, halogen, halogen-C_1–C_4-alkyl, halogen-C_1–C_4-alkoxy, Di-C_1–C_3-alkyl-amino, C_1–C_3-alkyl-amino or C_1–C_3-alkoxy-C_1–C_3-alkoxy,

Z is —CH=,

R_5 is C_1–C_8-alkyl, C_3–C_8-cycloalkyl, C_1–C_3-alkoxy-C_1–C_3-alkyl, phenyl, or benzyl,

R_6 is C_1–C_6-alkyl or phenyl,

R_7 is C_1–C_4-alkyl,

R_8 is C_1–C_4-alkyl,

R_7 and R_8 are together with the adjacent nitrogen atom, morpholinyl, pyrrolidinyl, piperidyl or piperazinyl,

R_9 is hydrogen, chlorine, flourine, or C_1–C_3-alkyl,

R_{10} is hydrogen, chlorine, fluorine, trifluoromethyl or C_1–C_3-alkyl,

R_{11} is hydrogen, chlorine, fluorine, cyano, C_1–C_4-alkyl or phenyl,

X is oxygen or sulfur, and

n is 0, 1 or 2.

4,601,747

N-ALKOXYAMINOSULFONYLUREAS AND N-ALKYLSULFONYLAMINOSULFONYLUREAS AND PYRIMIDINO THIADIAZINE OXIDES AS HERBICIDES AND PLANT GROWTH-REGULATORS

Lothar Willms, Unkel; Hilmar Mildenberger, Kelkheim; Klaus Baüer Rodgau; Helmut Bürstell, Frankfurt am Main, and Hermann Bieringer, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

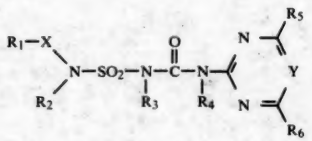
Filed Jul. 5, 1984, Ser. No. 627,763

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324802

Int. Cl.[4] C07D *239/42;* A01N *9/22*

U.S. Cl. 71—92 **6 Claims**

1. A compound of the formula I



in which X is O or $-SO_2-$, Y is CH, R_1 is a (C_1–C_6)-alkyl, (C_2–C_6)-alkenyl or (C_2–C_6)-alkinyl radical which is unsubstituted or substituted by halogen, (C_1–C_4)-alkoxy or (C_1–C_4)-alkoxycarbonyl, R_2 is hydrogen, (C_1–C_6)-alkyl, (C_2–C_6)-alkenyl, (C_2–C_6)-alkinyl or cyclohexyl, R_3 and R_4 independently of one another are hydrogen or (C_1–C_4)-alkyl, and R_5 and R_6 independently of one another are hydrogen, (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy, said alkyl or alkoxy unsubstituted, monosubstituted or disubstituted by halogen, (C_1–C_4)-alkoxy or (C_1–C_4)-alkylthio, or are halogen, (C_1–C_4)-alkylthio, (C_1–C_4)-alkylamino or (C_1–C_4)-dialkylamino, and also, if R_2 and R_3 are hydrogen, physiologically acceptable salts thereof.

5. A process for controlling undesirable plant growth or for regulating plant growth, which comprises applying an effective amount of a compound as claimed in claim 1 to the plants to be treated or to the area cultivated.

4,601,748

2-PHENOXY PROPIONIC ACID DERIVATIVES OF PENTITE, PROCESS FOR THE PRODUCTION OF THESE COMPOUNDS AS WELL AS COMPOSITIONS CONTAINING THE SAME HAVING HERBICIDAL EFFECTIVENESS

Hans-Rudolf Krüger, and Friedrich Arndt, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

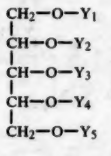
Filed Oct. 7, 1983, Ser. No. 540,611

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1982, 3239035

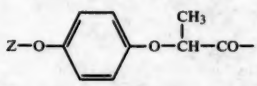
Int. Cl.[4] C07D *213/64;* A01N *43/40*

U.S. Cl. 71—94 **14 Claims**

1. 2-Phenoxy propionic acid derivatives of pentites of the formula:



wherein, one substituent of the group consisting of Y_1, Y_3 and Y_5, is the group



and pairs of other substituents Y are the radicals from the group consisting of Y_2/Y_3 and Y_4/Y_5, Y_1/Y_2 and Y_4/Y_5, and Y_1/Y_2 and Y_3/Y_4, are the group

wherein,

Z represents a member selected from the group consisting of 5-trifluoromethyl-2-pyridyl, 3-chloro-5-trifluoromethyl-2-pyridyl and 3,5-dichloro-2-pyridyl;

R_1 represents a member selected from the group consisting of hydrogen, methyl and ethyl; and

R_2 represents a member selected from the group consisting of methyl, ethyl, octyl, chloromethyl, phenyl and 4-chlorophenyl.

14. A herbicidal composition comprising an effective amount of a 2-phenoxy propionic acid derivative of pentite selected from the group consisting of:

5-O-2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(isopropylidene)-xylite;

1-O-2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-2,3:4,5-bis-O-(isopropylidene)-D-arabite;

3-O-2-[4-5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-1,2:4,5-bis-O-(isopropylidene)-adonite;

5-O-2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(phenylmethylene)-xylite;

5-O-2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(4-chlorophenylmethylene)-xylite;

5-O-2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(methylmethylene)-xylite;

5-O-2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(methyloctylmethylene)-xylite;

5-O-2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(chloromethylmethylene)-xylite;

5-O-2-[4-(2,4-dichlorophenoxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(isopropylodene)-xylite;

5-O-{2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl}-1,2:3,4-bis-O-(ethylmethyl-methylene)-xylite;

5-O-{2-[4-(5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl}-1,2:3,4-bis-O-(diethylmethylene)-xylite;

5-O-2-[4-(3,5-dichloro-2-pyridyloxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(isopropylidene)-xylite;

5-O-2-[4-(3-chloro-5-trifluoromethyl-2-pyridyloxy)-phenoxy]-propionyl-1,2:3,4-bis-O-(isopropylidene)-xylite; and together with suitable solid or liquid carriers therefore.

4,601,749

METHOD FOR ADJUSTING CHEMICAL COMPOSITION OF MOLTEN PIG IRON TAPPED FROM BLAST FURNACE

Kenzo Yamada; Katsuhiro Iwasaki, both of Fukuyama; Mitsuru Ohtsuki, Tokyo, and Haruo Ito, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

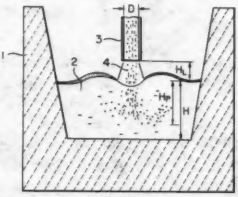
PCT No. PCT/JP85/00045, § 371 Date Sep. 4, 1985, § 102(e) Date Sep. 4, 1985, PCT Pub. No. WO85/03524, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 4, 1985, Ser. No. 776,968

Claims priority, application Japan, Feb. 4, 1984, 59-19183

Int. Cl.[4] C21C *7/02*

U.S. Cl. 75—53 **12 Claims**



1. In a method for adjusting the chemical composition of molten pig iron tapped from a blast furnace, which comprises:

substantially vertically arranging at least one lance above a hot-metal runner for directing molten pig iron tapped from a blast furnace into a hot-metal ladle so that the lowermost end of said at least one lance is spaced apart by a prescribed distance from the surface of molten pig iron flowing through said hot-metal runner, and blowing, through said at least one lance, a granular chemical composition adjusting agent by means of a carrier gas into molten pig iron flowing through said hot-metal runner to adjust the chemical composition of said molten pig iron;

the improvement wherein:

said blowing of said granular chemical composition adjusting agent through said at least one lance into said molten pig iron is carried out so as to satisfy the following two equations:

$$0.5H \leqq Hp < H \quad (1)$$

$$Hp = M \cdot G \cdot \exp(-\bar{r})/(D + 0.02H_L)^2 \quad (2)$$

in equations (1) and (2),

H: depth of molten pig iron in the hot-metal runner (mm),

Hp: penetration depth of the granular chemical composition adjusting agent into molten pig iron in the hot-metal runner (mm),

M: flow rate of the granular chemical composition adjusting agent (kg/minute),

G: flow rate of the carrier gas (Nm^3/minute),

$\bar{r}$: average particle size of the granular chemical composition adjusting agent (mm),

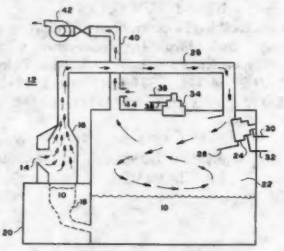
D: inside diameter of the lance (mm), and

H_L: distance between the surface of molten pig iron in the hot-metal runner and the lowermost end of the lance (mm).

4,601,750
SCRAP MELTING SYSTEM

Casimir B. Robak, Newburgh; Everett M. Ramsey, Richland; Gary A. Beil, and Bruce A. Gray, both of Newburgh, all of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 28, 1985, Ser. No. 750,337
Int. Cl.[4] C22B *21/00, 9/16*
U.S. Cl. 75—65 R **10 Claims**



1. A process for removing hydrocarbon combustibles from the surface of metal and recovering the heat content therefrom, said process being carried out in a system having at least a smoke collection zone, a heating zone and burner means supplied with fuel and air, said process comprising the steps of:

(a) providing a bath of moving molten metal in the smoke collection zone;

(b) charging the metal into the moving molten metal bath, said charging generating smoke and vaporizing the hydrocarbon combustibles to provide unburned hydrocarbon fumes; and

(c) firing the burner means to

(1) draw gas into the smoke collection zone to entrain and transport said smoke and fumes from the smoke collection zone to the burner means, said gas also providing oxygen for incineration of said smoke and fumes;

(2) incinerate said smoke and fumes to provide hot gas; and

(3) jet said hot gas into said heating zone.

4,601,751
PROCESS FOR THE PRODUCTION OF CAST IRON CONTAINING SPHERICAL GRAPHITE

Urs Brandenberger, Dachsen; Ivo Henych, Schaffhausen; Klaus Hornung, Stein am Rhein, and Werner Menk, Schaffhausen, all of Switzerland, assignors to Georg Fischer AG, Schaffhausen, Switzerland

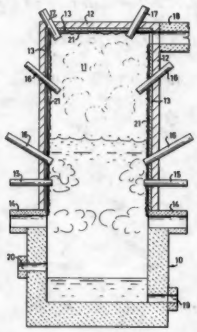
Filed Jul. 23, 1985, Ser. No. 757,885
Claims priority, application Switzerland, Jul. 26, 1984, 3624/84
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—130 R **9 Claims**

1. A process for the production of cast iron containing spheroidal graphite, comprising adding metallic magnesium to a pool of molten iron having sulfur therein to form molten cast iron containing spheroidal graphite and a slag containing magnesium sulphide, and thereafter adding a sulfur stabilizing agent to said slag to convert said magnesium sulphide in said slag to a thermodynamically more stable sulphide compound, whereby resulphurization of said cast iron is prevented.

4,601,752
METHOD OF MANUFACTURING METALS AND/OR GENERATING SLAG

Sven Santén, Hofors, Sweden; Jerome Feinman, Grand Junction, Colo., and Sune Eriksson, Järfälla, Sweden, assignors to SKF Steel Engineering AB, Hofors, Sweden

Filed Apr. 5, 1985, Ser. No. 720,553
Claims priority, application Sweden, Oct. 19, 1984, 8405230
Int. Cl.[4] C22C *33/00*
U.S. Cl. 75—10.22 **7 Claims**



1. A process for manufacturing metals and/or generating slag comprising

preheating and melting oxide ore in a first upper oxidation zone of a reactor by the combustion of carbon monoxide and hydrogen with a gas containing oxygen, the carbon monoxide and hydrogen being produced in a second middle reduction zone of said reactor; and

forming a slag bath in said second middle reduction zone of said reactor and at least partially reducing the preheated and melted ore in said slag bath by the simultaneous injection therein of (i) a reducing agent selected from a carbonaceous material, a hydrocarbon-containing material and mixtures thereof and (ii) gas heated in a plasma generator to form a metal and a gas containing carbon monoxide and hydrogen; and

removing said metal and slag from a third lower zone of said reactor.

4,601,753
POWDERED IRON CORE MAGNETIC DEVICES

Trasimond A. Soileau, Flat Rock, and Lawrence W. Speaker, Hendersonville, both of N.C., assignors to General Electric Company, Hendersonville, N.C.

Division of Ser. No. 491,830, May 5, 1983. This application Sep. 20, 1985, Ser. No. 777,998
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—251 **7 Claims**

1. Treated iron powder suitable for compaction, said powder comprising:

iron powder consisting of iron particles having a coating of an alkali metal silicate and an overcoating of a high temperature polymer selected from the group consisting of silicones, polyimides, fluorocarbons and acrylics, said coating and overcoating being effective for providing insulation between particles.

4,601,754

RARE EARTH-CONTAINING MAGNETS

Mohammad H. Ghandehari, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 30, 1984, Ser. No. 595,290
Int. Cl.[4] B22F 1/00
U.S. Cl. 75—252 19 Claims

1. A composition for producing rare earth-ferromagnetic metal permanent magnets comprising a mixture of the components:

(a) a major amount of a particulate rare earth-ferromagnetic metal alloy;

(b) a minor amount of a particulate sintering aid alloy which contains rare earth and ferromagnetic metal; and

(c) about 0.1 to about 2 percent by weight of a particulate additive material selected from the group consisting of refractory oxides, carbides, and nitrides.

4,601,755

CERIUM BASED GLASS POLISHING COMPOSITIONS

Pierre Mélard, Lagord; Marcel Peltier, La Rochelle, and Francis Tastu, Nieul/sur/Mer, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jul. 30, 1984, Ser. No. 635,828
Claims priority, application France, Jul. 29, 1983, 83 12519
Int. Cl.[4] C09G 1/02
U.S. Cl. 106—3 59 Claims

1. A polishing composition of matter comprising (i) at least one crystalline phase of CeO_2 type, and (ii) a crystalline phase which comprises a rare earth pyrosilicate having the formula $Ln_{2-x}Ce_xSi_2O_7$, wherein Ln is at least one lanthanide or yttrium and x is a number ranging from zero to less than 2.

4,601,756

RECORDING LIQUID

Masahiro Chiba; Kazuo Iwata, both of Yokohama; Tadayuki Nakousai, Atsugi; Hiroko Ogawa, Chigasaki, and Takashi Ohba, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 661,081
Claims priority, application Japan, Oct. 19, 1983, 58-194076; Oct. 19, 1983, 58-194077; Oct. 19, 1983, 58-194078; Oct. 19, 1983, 58-194079
Int. Cl.[4] C09D 11/02
U.S. Cl. 106—22 8 Claims

1. A recording liquid comprising a liquid composition having water-soluble dyes as a coloring component, wherein said coloring component is C.I. Food Black 2 and a member of the group consisting of at least one water-soluble blue dye, at least one water-soluble red dye, at least one water-soluble yellow dye and mixtures thereof wherein the weight ratio of the yellow colored dye to the Food Black 2 is from about 1:100 to 30:100; the weight ratio of the red colored dye to the Food Black 2 is from about 1:100 to 30:100 and the weight ratio of the blus colored dye to the Food Black 2 is from about 1:10 to 10:1.

4,601,757

NONVOLATILE PLASTICIZERS AND NAIL POLISH CONTAINING THE SAME

Wallace H. Brown, Downers Grove; Robert E. Ansel, and Kevin P. Murray, both of Hoffman Estates, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 7, 1985, Ser. No. 709,203
Int. Cl.[4] C08L 1/08; C08K 5/16; C07C 101/02
U.S. Cl. 106—183 18 Claims

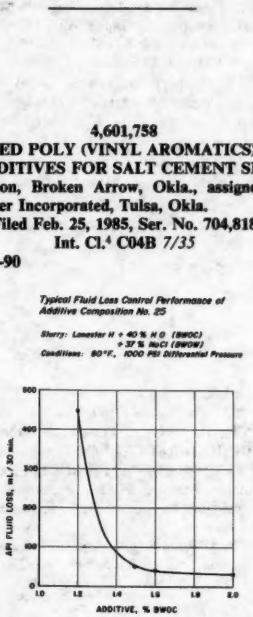
1. The carboxyl-functional amide reaction product of: (1) a secondary amine-functional adduct of an acrylate compound and about one amine equivalent per acrylate group in the acrylate compound of an organic primary amine having a molecular weight in the range of about 50 to about 8000; with (2) a dicarboxylic acid anhydride, and said carboxyl-functional amide reaction product having a molecular weight in the range of from about 350 to about 10,000.

4,601,758

SULFONATED POLY (VINYL AROMATICS) AS FLUID LOSS ADDITIVES FOR SALT CEMENT SLURRIES

Erik B. Nelson, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Feb. 25, 1985, Ser. No. 704,818
Int. Cl.[4] C04B 7/35
U.S. Cl. 106—90 23 Claims



1. In a salt water cement slurry containing a hydraulic cement and salt water, the improvement consisting of including in said slurry an effective amount of a fluid loss additive which comprises an admixture of at least:

(a) about 0.5 parts of a water soluble sulfonated styrene/-maleic anhydride copolymer;

(b) about 0.5 parts of a water soluble salt of a sulfonated polystyrene;

(c) about 0.5 parts of a water soluble salt of a sulfonated polyvinyltoluene; and

(d) about 0.5 parts of a water soluble salt of sulfonated polynaphthalene/formaldehyde condensate; wherein all parts are parts by weight per 100 parts by weight of dry hydraulic cement.

12. A method of cementing a well traversing a subterranean formation consisting of admixing with every 100 parts by weight of a dry hydraulic cement at least:

(a) 0.5 parts by weight of a water soluble sulfonated styrene/maleic anhydride copolymer per 100 parts by weight of dry hydraulic cement;

(b) 0.5 parts by weight of a water soluble salt of a sulfonated polystyrene per 100 parts by weight of dry hydraulic cement;

(c) 0.5 parts by weight of a water soluble salt of a sulfonated polyvinyltoluene; and

(d) 0.5 parts by weight of a water soluble salt of sulfonated polynaphthalene/formaldehyde condensate and from about 35 to 55 parts by weight of a saline water solution, to prepare an aqueous slurry, and injecting said slurry down the well into a confined zone in the formation, and permitting said slurry to set and harden.

4,601,759

PIGMENT COMPOSITIONS, METHOD FOR PRODUCING SAME, AND COLORED RESIN COMPOSITIONS

Toshio Furubayashi; Takenori Funatsu; Yoichi Inuzuka; Osamu Aihara, and Mikio Hayashi, all of Kyobashi, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1984, Ser. No. 598,643
Claims priority, application Japan, Apr. 15, 1983, 58-65232
Int. Cl.[4] C08J *3/12*; C09C *3/00*; C09D *7/14*
U.S. Cl. 106—308 M 19 Claims

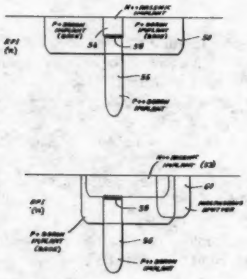
1. A method for preparing a pigment composition comprising a pigment and water, comprising the steps of dehydrating a wet cake of a pigment in a finely powdered state to such an extent that the resulting moisture content is from 2 to 19 wt.% while maintaining the pigment in the wet cake substantially unchanged in size and shape, and non-agglomerated.

4,601,760

ION-IMPLANTED PROCESS FOR FORMING IC WAFER WITH BURIED-REFERENCE DIODE AND IC STRUCTURE MADE WITH SUCH PROCESS

Steven M. Hemmah, Salem, N.H., and Richard S. Payne, Andover, Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Continuation of Ser. No. 608,469, May 9, 1984, abandoned. This application Sep. 16, 1985, Ser. No. 776,469
Int. Cl.[4] H01L *21/265*, *21/223*
U.S. Cl. 148—1.5 19 Claims



1. The method of making an IC wafer with a buried reference diode comprising the steps of:

implanting p-type ions in said wafer to form a p-type first region extending a substantial distance into the wafer;

implanting n-type ions in said wafer to form an n-type second region directly over said p-type region and forming therewith an all-implanted sub-surface junction suitable for stable breakdown;

providing means for establishing electrical connection to said n-type second region; and

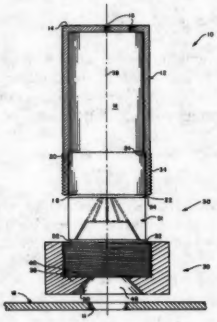
forming with p-type dopant a third region joining said p-type first region below the surface of said wafer and extending out laterally beyond said p-type first region to the surface of said wafer to provide for making electrical connection to the p-type first region side of said sub-surface junction.

4,601,761

NOZZLE FOR SELF-CONTAINED CUTTING TORCHES

Paul W. Proctor, White Plains, and Robert L. Dow, Laplata, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 17, 1985, Ser. No. 745,738
Int. Cl.[4] B23K *7/00*
U.S. Cl. 148—9 R 17 Claims



1. A self contained torch for forming large holes in a workpiece, comprising:

a storage means for storing pyrotechnic material;

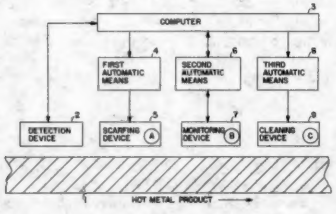
a nozzle means for conducting fluid generated by combustion of the pyrotechnic material against a workpiece, the nozzle means including fluid path means for guiding the fluid in a cookie cutter pattern against a workpiece at an angle outwardly of the zone of contact between the fluid and the workpiece.

4,601,762

METHODS FOR CONDITIONING METAL PRODUCTS

Robert A. Pirlet, Embourg, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

PCT No. PCT/BE84/00001, § 371 Date Sep. 14, 1984, § 102(e) Date Sep. 14, 1984, PCT Pub. No. WO84/02860, PCT Pub. Date Aug. 2, 1984
PCT Filed Jan. 13, 1984, Ser. No. 654,005
Claims priority, application Belgium, Jan. 20, 1983, 47767
Int. Cl.[4] B23K *7/06*
U.S. Cl. 148—9.5 6 Claims



1. A method of treating a moving hot metal product comprising inspecting at least one face of the metal product by automatically displacing a detection device along said face, using said detection device to detect defects present in the product and to generate data concerning the coordinate location and depth of said defects, introducing said data into a computer, and using said computer for controlling:

a first automatic means to position a scarfing device at a location where a defect has been detected and to operate

the scarfing device for a time necessary to remove the defect;
scarfing the defect;
a second automatic means which monitors the removal of the defect;
and a third automatic means which cleans the product surface;
at least one of said first, second, and third automatic means comprising a programmable robot.

4,601,763

METHOD FOR THE MECHANICAL SOFT-SOLDERING OF HEAVY METALS UTILIZING A FLUXING AGENT

Tomas Stratil, Steinhausen; Milos Pisinger, Zürich, and Peter Fehr, Zug, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Oct. 11, 1984, Ser. No. 659,643
Int. Cl.[4] B23K *35/34*
U.S. Cl. 148—23 **24 Claims**

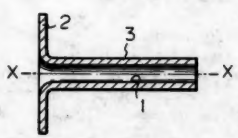
1. A method for the mechanical soft soldering of heavy metals comprising applying to the surface area of an article to be soldered a rosin-free and halogen-free fluxing composition comprising about 0.8% to 3% by weight of an organic acid based solder-active component, about 0.6% to 2.5% by weight of a carrier component, said carrier component being liquid at the temperature of the molten solder and being removable by a flowing wave of molten solder during the soldering process, said carrier component selected from the group consisting of an organic ester and an organic acid, and the balance of said fluxing composition comprising a solvent.

4,601,764

METHOD FOR PRODUCING ANISTROPIC CONFIGURATION MAGNET

Kenzaburo Iijima; Toshiharu Hoshi; Kazumoto Asano, and Yoshinori Hayashi, all of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Division of Ser. No. 496,814, May 23, 1983, Pat. No. 4,580,119.
This application Jul. 15, 1985, Ser. No. 755,002
Claims priority, application Japan, May 25, 1982, 57-88464
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—101 **2 Claims**



1. Method for producing a configuration magnet comprising the steps of:
heat treating a straight tube made of Fe-Cr-Co alloy under magnetization in its axial direction,
plastically deforming at least a part of said straight tube into a flange section extending substantially radially from the center axis of said straight tube, and
applying age-hardening to said straight tube including said flange section.

4,601,765

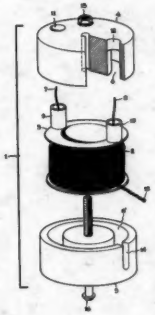
POWDERED IRON CORE MAGNETIC DEVICES

Trasimond A. Soileau, Flat Rock, and Lawrence W. Speaker, Hendersonville, both of N.C., assignors to General Electric Company, Hendersonville, N.C.

Filed May 5, 1983, Ser. No. 491,830
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—104 **20 Claims**

1. A magnetic core comprising densely packed iron particles having a coating of an alkali metal silicate insulating material and an overcoating of a polymer film selected from the group consisting of silicones, polyimides, fluorocarbons and acrylics, said coating and overcoating providing substantial insulation between particles.

5. A compacted powdered iron magnetic core component for use in A.C. electrical devices comprising:
iron powder consisting of particles sized less than 0.05 inch prior to compaction,



the particles of said powder having been coated with alkali metal silicate, overcoated with a polymer film selected from the group consisting of silicones, polyimides, fluorocarbons and acrylics providing insulation between particles, and compacted to at least 90% of theoretical iron density, and
the so formed compact having been annealed after said compaction and exhibiting relatively low hysteresis losses together with relatively low eddy current losses.

4,601,766

LOW LOSS ELECTRICAL STEEL STRIP AND METHOD FOR PRODUCING SAME

Prabhat K. Rastogi, and Grigory Lyudkovsky, both of Munster, Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jan. 25, 1985, Ser. No. 695,009
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—111 **13 Claims**

1. In a method for producing cold rolled, steel strip useful in electric motor core laminations, the steps of:
providing a steel consisting essentially of the following composition in wt. %:
carbon: 0.02 max.
manganese: 0.45–0.70
silicon: 0.8–1.1
aluminum: 0.20–0.40
phosphorus: 0.1 max.
sulfur: 0.01 max.
nitrogen: 0.007 max.
iron: essentially the balance;
hot rolling said steel into steel strip;
coiling said hot rolled steel strip;
cold rolling said steel strip;
subjecting said steel strip to a first continuous anneal at a strip temperature in the range 800°–900° C. (1472°–1652° F.) for at least about 45 seconds, and then allowing said strip to cool;
temper rolling said strip to produce a reduction of about 4–9%;
and then, after said temper rolling step and before any stamping step, subjecting said steel strip to a second continuous anneal, in a decarburizing atmosphere, at a strip temperature in the range 800°–900° C. (1472°–1652° F.) for at least about 45 seconds up to a maximum time limit

which avoids grain growth to a ferritic grain size number below about ASTM 3, to reduce the carbon content of the strip to no greater than 0.007 wt. %;

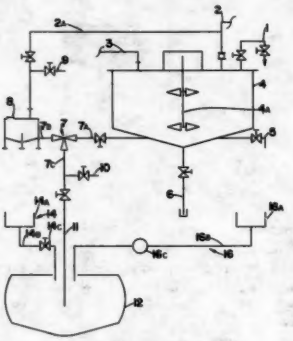
whereby said steel strip, after said second continuous anneal, has a 1.5 T (15 kG) average core loss less than 5.3 W/kg (2.4 W/lb.) and average peak permeability in the range 1100–1300 G/Oe., for a thickness of 0.018 in. (0.46 mm).

4,601,767

VINSOL COATING IN SWEETIE BARREL

Richard H. Youngstrand, Woodville, Fla., assignor to Olin Corporation, Stamford, Conn.

Filed Jan. 29, 1985, Ser. No. 696,057
Int. Cl.[4] D03D *23/00*
U.S. Cl. 149—109.6 **10 Claims**



1. A process for producing deterred double base propellant powder, which comprises the steps of:

(a) adding a quantity of graphite powder to sweetie barrel:

(b) Adding a quantity of propellant powder to a sweetie barrel;

(c) Heating said sweetie barrel to a predetermined temperature;

(d) Mixing a quantity of a high-melting, hydrocarbon, sticky thermoplastic deterrent resin with a quantity of a diluent solvent, the solvent having an evaporation point below that of the temperature of the heated sweetie barrel;

(e) intermittently adding the mixed sticky deterrent resin and solvent solution to the powder in the sweetie barrel while rotating the sweetie barrel;

(f) Continuing to rotate the powder and solution together in the barrel for a sufficient time following the addition of the solution to allow the solvent to substantially entirely evaporate.

4,601,768

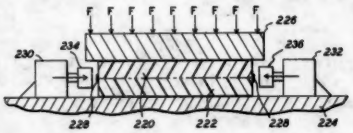
METHOD AND APPARATUS FOR TREATING PLASTIC WELDS TO RELIEVE STRESSES THEREIN

John V. Bouyoucos, Pittsford, and David W. Durfee, Rochester, both of N.Y., assignors to Hydroacoustics, Inc., Rochester, N.Y.

Filed May 11, 1984, Ser. No. 609,539
Int. Cl.[4] B29C *65/06, 65/18*
U.S. Cl. 156—73.5 **53 Claims**

1. In the welding of plastic parts wherein a weld is formed at an interface between the parts, the method of treating the weld which comprises the steps of supporting portions of said parts to expose an edge of said parts, and after said weld is formed and has cooled to a solid condition with tensile stresses developed therein and while said weld is still warmer than and of reduced yield strength relative to areas of said parts adjacent to said weld, then applying compressive forces selectively to said portions, said forces being of sufficient magnitude and held for sufficient duration to produce yielding selectively in the warmer and tensile-stressed zones of said weld, to at least partially relieve tensile-stresses in said weld and thereby reduce the susceptibility of said weld to a solvent induced crazing and cracking.

22. Apparatus for relieving tensile-stresses in plastic parts at an interface defined by surfaces which are heated to melt and



held together to fuse and form a weld extending to an edge of said parts, which comprises means for supporting said parts to expose portions which includes said interface, and means for applying compressive forces of sufficient magnitude and duration to deform the weld zone at said interface in said exposed portions to relieve said tensile-stresses, said force applying means being operative to apply said forces as impact forces.

4,601,769

PROCESS FOR STABILIZING THE VISCOSITY OF AN EPOXY RESIN-ACID ANHYDRIDE SYSTEM DURING REACTION AND CURE

Ronald L. DeHoff, Short Hills Terrace Apt. 3E, 806 Morrison Ave., Short Hills, N.J. 07078

Filed Sep. 27, 1985, Ser. No. 785,052
Int. Cl.[4] B65H *81/00*; C08G *59/20*
U.S. Cl. 156—169 **20 Claims**

1. A process for stabilizing the viscosity of a system comprising a blend of a liquid epoxy resin, a liquid anhydride curing agent, and a quaternary ammonium salt promoter for an epoxy-anhydride reaction during the heating and curing operations by

(a) adding to said liquid epoxy resin a finely ground, solid resinous particulate capable of reacting with and dissolving in said blend, together with a metallo-organic compound accelerator for said epoxy-anhydride reaction, and

(b) adding to said liquid anhydride a minor amount of a solid anhydride of high reactivity,

to produce a system having a viscosity after heating which is low enough to release entrapped air, and high enough not to run out of an impregnated structure before gelation takes place.

4,601,770

FIBER REINFORCED PLASTIC PIPE TEE

Ronald G. Ulrich, Burbank, and Ralph S. Friedrich, Hermosa Beach, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Division of Ser. No. 186,335, Sep. 11, 1980. This application Sep. 19, 1983, Ser. No. 533,651
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—171 **10 Claims**

1. A method for winding a fiber reinforced plastic pipe tee having a straight run and a side branch, a pair of crotches between the branch and run and a diaphragm area on each side of the mid-plane of the tee near the intersection of the branch and run, comprising the steps of winding reinforcing fiber rovings and liquid synthetic resin around a T-shaped mandrel for completely covering the mandrel with a plurality of patterns including

a pattern (V) starting from a crotch, extending helically across one side of the tee and around the back of the run, then across the opposite side of the tee crossing the center

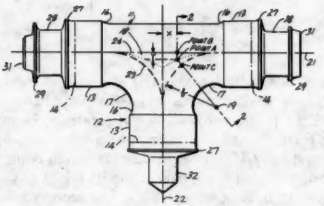
plane of the branch and ending at the end of the branch; and further comprising:

a sufficient plurality of different optional steps of wrapping reinforcing fiber rovings for covering the entire pipe tee selected from the steps of:

(I) starting at one side of an end of the run extending helically with a first hand around the back of the run, through the opposite crotch, then helically with a second hand around the back of the run, and ending at the opposite side of the run at the same end;

(II) starting at one side of an end of the run, extending helically with a first hand around the back of the run, then through the opposite crotch, then circumferentially around the opposite end of the run at least one revolution back to the crotch, then helically with a second hand around the back of the run, and ending on the opposite side of the same end of the run;

(III) starting near the back of the run at one end, extending helically around the run across the diaphragm area, then through the opposite crotch, then circumferentially around the branch at least one-half revolution, then through a crotch, then helically around the body of the tee across a diaphragm area, and ending near the back of the run at an end;



(IV) starting at one end of the run extending helically around the run across a center portion of the back of the run and ending at the opposite end of the run; and

(V) a generally 8-shaped pattern starting in one crotch, extending helically with a first hand around the back of the run, then through the opposite crotch, then helically with a second hand around the back of the run, and ending in the starting crotch; or

(VI) starting in one crotch, extending helically with a first hand around the back of the run, then through the opposite crotch, then at least one half turn around the branch to the starting crotch, then helically with a second hand around the back of the run and ending in the opposite crotch; and including

interleavings of such patterns; and then solidifying the resin; and

separating the pipe tee and the mandrel.

4,601,771

LABELING MACHINE ATTACHMENT FOR APPLYING PRESSURE SENSITIVE LABELS TO ROUND CONTAINERS

James G. Wesley, Cicero, Ill., assignor to Labelette Company, Forest Park, Ill.

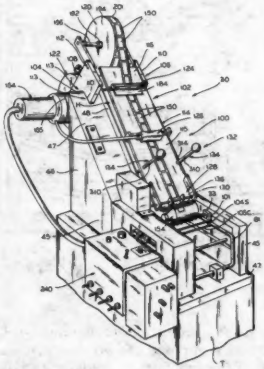
Filed Dec. 26, 1984, Ser. No. 686,589
Int. Cl.[4] B32B 1/00
U.S. Cl. 156—215 **10 Claims**

1. In a semi-automatic labeling machine for applying discrete labels to each container of a run of round containers each of which is of the same predetermined size, with the machine including a label supply hopper having a downwardly sloping floor plate, a glue applying station, a labeling station including a pair of support rollers disposed normally of the path of movement of the individual labels from the supply hopper therefor through the stations, upon which a round container of the container run to be labeled may be manually applied on the side thereof to be supported and rotated about its longitudinal axis by said support rollers, with one of the support rollers being mounted for adjustment movement toward and away from the other support roller to accommodate labeling containers of container runs made up of containers of all the same but variant container run sizes, and means for individaully feeding said discrete labels from the hopper through the glue applying station along the path of movement for application of glue thereto and then to label applying relation at the labeling station, and after consecutive of the labels are applied to consecutive of the run containers, the labeled container is manually removed from the support rollers to be manually replaced by the next run container to be labeled,

an attachment therefor for adapting said machine to consecutively apply discrete pressure sensitive adhesive backed labels to each container of a run of round containers each of which is of the same predetermined size and each of which is consecutively manually applied to the support rollers and manually removed therefrom when labeled, with the pressure sensitive labels to be so applied to the containers of such run being each of the same predetermined size and consecutively adhered in equally spaced relation to a release agent coated side of a web in ribbon form,

said attachment comprising:

an elongate feed table,



a mounting frame for removably and adjustably mounting said feed table on the upper end of the machine hopper floor plate,

said feed table adjacent one end of same being adjustably mounted on said mounting frame cantilever fashion for adjustably disposing the other end of said feed table at the labeling station above the machine support rollers in label applying relation to a round container, of the run of such containers, that has been manually applied to and supported on the machine rollers for pressure sensitive label labeling thereof,

means for mounting the ribbon bearing the pressure sensitive labels on said feed table for forward movement longitudinally of and across the upper surface of said feed table in the direction of said other end thereof, with the pressure sensitive labels of the ribbon adhered to the ribbon facing upwardly,

said feed table at said other end thereof terminating in a flat angle wedge type edging extending traversely thereof,

means for adjusting said mounting frame relative to the machine hopper floor plate for disposing said feed table edging into parallelism with the axis of rotation of a round container, of the run of such containers, when supported

on the machine rollers at the labeling station and rotated thereby,

means for defining a training way for the ribbon bearing the pressure sensitive labels for forward movement of the ribbon about said edging and reversely under said table,

means for intermittently feeding the ribbon longitudinally thereof in said forward direction when a round container, of the run of such containers, is manually applied to and is rotated by the support rollers, whereby the ribbon labels are individually and consecutively separated from the ribbon as the ribbon is passed over and about said edging,

means for taking up the ribbon after it passes said edging,

and means mounted at said feed table other end adjacent said edging for directing the individual labels onto the run container being labeled as such label is separated from the ribbon.

4,601,772

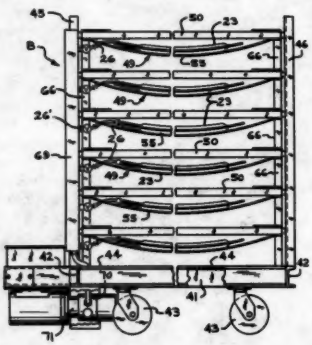
APPARATUS FOR PRODUCING LAMINATED SAFETY GLASS

Harold E. McKelvey, Farmington Hills, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Feb. 11, 1985, Ser. No. 700,135

Int. Cl.[4] B32B *31/24*

U.S. Cl. 156—382 **8 Claims**



6. Apparatus for use in the preparation of laminated safety glass assemblies composed of two sheets of glass and an interposed layer of thermoplastic material encased in a sealed plastic bag, comprising a substantially rectangular heating oven, having a bottom wall provided with a longitudinally extending slot, a rack including a base operating in said slot and provided with a plurality of horizontal shelves arranged in vertically spaced relation for supporting individual laminated assemblies, a vacuum manifold carried by the rack, vacuum connections between the manifold and the individual plastic bags containing the safety glass assemblies, means for creating a vacuum in the manifold to withdraw the air from within the individual bags, and means for moving the rack through the heating oven.

4,601,773

APPARATUS FOR SUPPLYING BEAD PORTION IN TIRE-FORMING MACHINE

Masayoshi Kubo, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

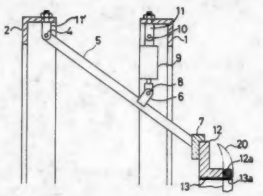
Continuation of Ser. No. 371,459, Apr. 23, 1982, abandoned. This application Jul. 6, 1984, Ser. No. 628,436

Claims priority, application Japan, Apr. 27, 1981, 56-63813

Int. Cl.[4] B29D *30/18*

U.S. Cl. 156—403 **1 Claim**

1. In a tire-forming machine on a common base and having a headstock (B), a first tailstock (G) and a second tailstock (C) between said headstock (B) and said first tailstock (G) and having an apparatus for assembling an inner liner, carcass ply and other plys in cylindrical form to produce a tire band on a band forming drum (F) mounted on said first tailstock (G), transferring said band by a band transfer means (H) to a carcass-forming drum (A) mounted on said headstock (B) and aligned with the same shaft as said band transfer means (H) to form the tire carcass while said carcass is on said carcass-forming drum (A), incorporating a plurality of beads into said carcass and applying a tread portion on said carcass, the machine including a first bead setter means (D) mounted on said headstock (B) to transfer a bead onto said carcass while the carcass is on the carcass-forming drum (A) by moving axially from its initial position, towards the carcass forming drum (A),



a second bead setter means (E) mounted on said second tailstock (C) to transfer a bead manually placed thereon onto said carcass while the carcass is on the carcass-forming drum by moving axially from its initial position, towards the carcass-forming drum (A), the improvement which comprises a bead-temporary supporting means (J) in its initial position between the band transfer means (H) and the second tailstock (C) to support a bead in circular form and with the axis of the bead coaxial with the axis of the carcass-forming drum, said bead-temporary supporting means (J) having mechanical transfer means to receive a bead placed manually thereon and to mechanically transfer said bead, in its circular form, to said first bead setter means (D) when said band transfer means transfers said band to said carcass-forming drum (A).

4,601,774

NOZZLE FOR COATERS AND APPLYING FILAMENTARY MATERIAL TO A CYLINDRICAL CORE

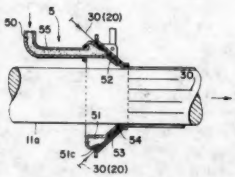
Fumio Usui, 441 Shimoasao, Asao-ku, Kawasaki-shi, Kanagawa, 215, Japan

Division of Ser. No. 456,089, Dec. 29, 1982, Pat. No. 4,511,424. This application Oct. 11, 1984, Ser. No. 660,489

Claims priority, application Japan, May 30, 1981, 56-83119

Int. Cl.[4] B05C *1/04*; B29C *47/20*

U.S. Cl. 156—433 **5 Claims**



1. A nozzle structure for supplying synthetic resin to a cylindrically formed body, said nozzle structure comprising a hollow annular nozzle through which the cylindrically formed body is passed, means for supplying a synthetic resin into said nozzle, said nozzle having an inside diameter greater than the outside diameter of the body for being spaced from the body, said nozzle having an annular opening facing along the body, a frustoconical member extending at a cone angle from an inner edge of said annular opening toward the body and having

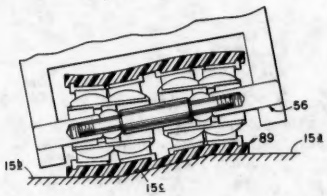
an inside diameter slightly larger than the outside diameter of the body for being spaced slightly from the body, and a frustoconical cover having substantially the same cone angle as said frustoconical member and extending from an outer edge of said annular opening to adjacent the body and having an inside diameter slightly larger than the outer diameter of the body for being spaced slightly therefrom, said frustoconical cover being spaced from said frustoconical member at least at the end thereof remote from said nozzle by a predetermined clearance to form an outlet adjacent the body, the said nozzle structure having apertures therein at the outer peripheral portion of said cover for admitting linear materials to be wound around the body for passage through said clearance where they are covered by a synthetic resin from the nozzle.

4,601,775

COMPLIANT PRESSER MEMBER FOR COMPOSITE TAPE LAYING MACHINE

Robert J. Grone, Elsmere, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 3, 1985, Ser. No. 740,708
Int. Cl.[4] E04D *15/06*
U.S. Cl. 156—523 **12 Claims**



1. In a tape laminating machine having a tape laying head for dispensing and pressing tape to a tape laydown surface, and having means for directing a tape laydown force against said laydown surface, a tape presser member assembly carried by said head, comprising:

(a) a base frame coupled to said head;

(b) an axle carried by said frame with its longitudinal axis substantially normal to the direction of said tape laydown force to transmit said force radially through said axle;

(c) force divider means carried by said axle for dividing said radial force into at least two separate radial components;

(d) at least two solid members in contact with said force divider means, said members including means for mounting said members and providing limited movement of said members in multiple directions;

(e) a distortable presser strip spanning and connected to said members; and

(f) means for stabilizing and biasing said presser strip into an undistorted shape.

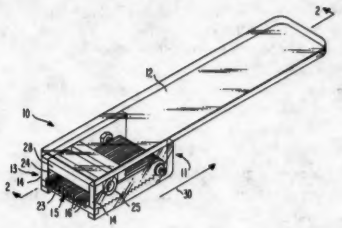
4,601,776

CARPET TAPE STRIPPER

Vaclav Kral, 1617 Beretania 1001, Honolulu, Hi. 96826

Filed Mar. 4, 1985, Ser. No. 708,048
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—584 **1 Claim**

1. A carpet tape stripper, comprising, in combination, an elongated hand and a working head on one end of said handle, said working head comprising an inverted, "U"-shaped frame on an underside of said handle, said frame including a pair of parallel, spaced apart side walls, and a scraper pivotally supported between said side walls; said scraper comprising a plurality of flat blades in parallel, spaced apart position alongside each other, a transverse extending bolt secured between said side walls, one end of each said blade having an opening freely receiving said bolt therethrough, a narrow extension upon an opposite end of each said blade, a transverse extending bar affixed between said side walls, each said blade extension resting upon said bar, a transverse extending, flexible, rubber



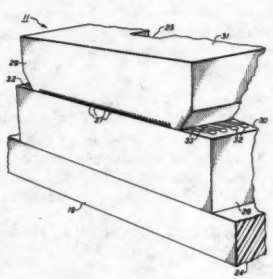
hose bearing between an upper edge of said blades and an underside of a bridging central portion of said frame, and a row of ratchet-type teeth along a lower edge of each said blade.

4,601,777

THERMAL INK JET PRINTHEAD AND PROCESS THEREFOR

William G. Hawkins, Webster; Donald J. Drake, Rochester, and Michael R. Campanelli, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1985, Ser. No. 719,410
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00;* C23F *1/02*
U.S. Cl. 156—626 **20 Claims**



1. A method for fabricating a printhead for use in an ink jet printing device, comprising the steps of:

(a) cleaning first and second silicon substrates, each having first and second parallel surfaces, the substrate surfaces being {100} planes;

(b) depositing a layer of insulating material on the surfaces of the substrates;

(c) forming an equally spaced, linear array of resistive material on the first surface of the first substrate for use as heating elements and forming a pattern of electrodes on the same substrate surface for enabling individual addressing of each heating element with current pulses;

(d) photolithographically patterning the insulative layer on the first surface of the second substrate to produce at least one via therein for orientation dependent etching of at least one recess in the second substrate bounded by {111} plane side walls;

(e) forming a plurality of equally spaced, parallel grooves in the first surface of the second substrate, one end of the grooves communicate with the recess and the other ends of the grooves are open;

(f) applying an adhesive to the insulative layer on the first surface of the second substrate, taking care not to permit the adhesive to run into the recess or grooves;

(g) aligning the first and second substrates with their first surfaces confronting and contacting each other, so that each groove contains a heating element therein spaced a predetermined distance from the groove open end; and

(h) curing the adhesive to bond the first and second substrates together to form the printhead, wherein the recess serves as an ink supplying manifold, the grooves serve as capillary filled channels, and the groove open ends serve as the printhead nozzles.

4,601,778

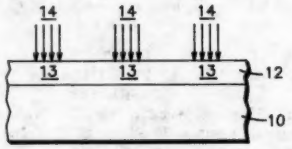
MASKLESS ETCHING OF POLYSILICON

Francine Y. Robb, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1985, Ser. No. 705,161

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—628 **2 Claims**



1. A method of etching polysilicon comprising the steps of:

exposing a portion of a polysilicon film to at least one of an oxygen plasma and a hydrogen plasma; and

exposing both treated and untreated portions of said polysilicon film to a polysilicon etchant.

4,601,779

METHOD OF PRODUCING A THIN SILICON-ON-INSULATOR LAYER

John R. Abernathey, Jericho; Jerome B. Lasky, Essex Junction; Larry A. Nesbit, Williston, all of Vt.; Thomas O. Sedgwick, Briarcliff Manor, and Scott Stiffler, Cortland, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1985, Ser. No. 747,746

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—628 **27 Claims**

1. A method of forming a thin semiconductor layer of substantially uniform thickness upon which semiconductor structures can be subsequently formed, comprising the steps of:

forming layer of silicon upon a silicon substrate;

implanting ions into said silicon layer in order to form a buried layer therein, said buried layer having etch characteristics which differ from those of said silicon layer;

bonding said silicon layer to a mechanical substrate;

removing said silicon substrate and portions of said silicon layer between said silicon substrate and said buried layer; and

removing said buried layer without removing under-laying portions of said silicon layer,

whereby said underlaying portions of said silicon layer remain on said mechanical substrate to form the thin semiconductor layer.

4,601,780

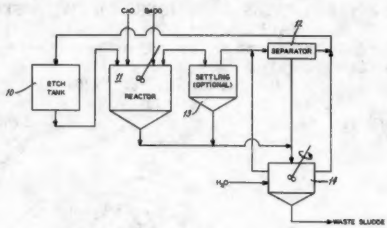
PROCESS OF RECOVERING ALUMINUM ETCHANT

Dolphus L. Coggins, and Walter E. Lindner, both of St. Louis, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 17, 1984, Ser. No. 682,274

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—642 **19 Claims**



1. A process for regenerating used caustic aluminum etchant solution comprising the steps of treating caustic solution containing dissolved aluminum and other contaminants from alloy elements and maskant by-products with calcium oxide and barium salt, reacting the dissolved metal and contaminants with the calcium oxide and barium salt to produce precipitates, and separating the caustic containing fluid from the said precipitates.

4,601,781

METHOD FOR IMPROVING STEP COVERAGE OF DIELECTRICS IN VLSI CIRCUITS

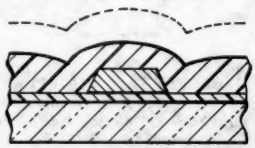
Jacques S. Mercier, Kanata, and Vu Q. Ho, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 9, 1984, Ser. No. 659,145

Claims priority, application Canada, Jun. 15, 1984, 456666

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **11 Claims**



1. In a process for making VLSI circuits, a method of depositing a dielectric layer over sharply profiled conducting regions spaced from one another and formed on a substrate, the method comprising depositing a dielectric layer over the wafer to a thickness appreciably greater than the thickness of the conducting regions until differential growth caused by the sharp profiles of the conducting regions ceases, and then etching the dielectric layer over the wafer until the dielectric layer has a thickness over the conducting regions comparable with the thickness of the conducting regions.

4,601,782

REACTIVE ION ETCHING PROCESS

Jacqueline K. Bianchi, San Jose; Robert A. Gdula, Los Gatos, and Dennis J. Lange, Aromas, all of Calif., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 20, 1985, Ser. No. 747,156
Int. Cl.[4] B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 4 Claims

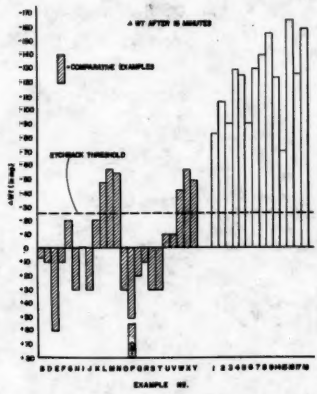
1. In a reactive ion process for etching a ceramic partially masked by a photoresist, the improvement characterized by using an etch gas comprising SF_6, a noble gas and a small percent of a carbon-containing gas.

4,601,783

HIGH CONCENTRATION SODIUM PERMANGANATE ETCH BATCH AND ITS USE IN DESMEARING AND/OR ETCHING PRINTED CIRCUIT BOARDS

Gerald Krulik, LaGuna Hills, Calif., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed May 31, 1985, Ser. No. 739,599
Int. Cl.[4] B44C 1/22; B29C 17/08; C03C 15/00, 25/06
U.S. Cl. 156—655 14 Claims



14. A process for etching back the surface of a circuit board which comprises contacting the circuit board with an aqueous, alkaline liquid solution consisting essentially of water, at least about 75 g/l of $NaMnO_4$ and NaOH in an amount sufficient so that the removal of substantially all of the manganese residues from the surface of a material contacted with said solution can be accomplished by acid neutralization.

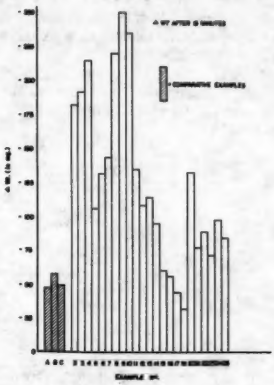
4,601,784

SODIUM PERMANGANATE ETCH BATHS CONTAINING A CO-ION FOR PERMANGANATE AND THEIR USE IN DESMEARING AND/OR ETCHING PRINTED CIRCUIT BOARDS

Gerald Krulik, LaGuna Hills, Calif., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed May 31, 1985, Ser. No. 739,726
Int. Cl.[4] B44C 1/22; B29C 17/08; C03C 15/00, 25/06
U.S. Cl. 156—655 13 Claims

13. A process for etching back the surface of a circuit board which comprises contacting the circuit board with an aqueous, alkaline liquid $NaMnO_4$ solution comprising water, alkali metal hydroxide, $NaMnO_4$ and from about 0.1 to about 3.0 moles per



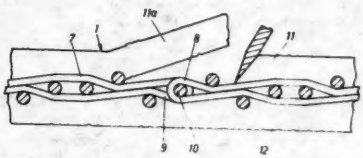
mole of MnO_4^- of a co-ion for MnO_4^- selected from the group consisting of K^+, Cs^+, Rb^+ and mixtures thereof.

4,601,785

FELT COMPRISING A LOOP SEAM FOR USE IN THE PRESS SECTION OF PAPERMAKING MACHINES AND A METHOD OF MANUFACTURING SUCH FELTS

Roland E. Lilja, Skärblacka, and Sven B. Nilsson, Dals-Långed, both of Sweden, assignors to Albany International Corp., Menands, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,050
Claims priority, application Sweden, Nov. 2, 1982, 8206222
Int. Cl.[4] D21F 7/10, 3/00
U.S. Cl. 162—199 11 Claims



1. A felt for use in the press section of a papermaking machine comprising:

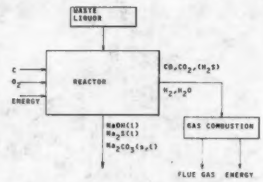
a base having machine-direction and cross-machine direction threads and having first and second base ends; a seam for selectively joining and releasing said first and second base ends; and batt having first and second batt ends, said batt further having first and second longitudinal portions corresponding to the machine direction, said first longitudinal portion being attached to said base with said first batt end spaced at a predetermined distance away from said first base end to leave a section of the base exposed and said second longitudinal portion corresponding to the machine direction being a continuation of said first longitudinal portion and extending past said second base end to form a flap;

whereby the felt may be installed on said papermachine press section by the opening of said seam to release said two base ends and position said felt in an operational configuration enabling the closing of said seam with said flap extending over said closed seam and said section of exposed base.

4,601,786
RECOVERY OF CHEMICALS FROM PULP WASTE LIQUOR WITH PLASMA GENERATOR HEATING

Sven Santén, Hofors; Ragnar Bernhard, and Sven-Erik Malmeblad, both of Falun, all of Sweden, assignors to SKF Steel Engineering AB, Hofors and Stora Kopparbergs Bergslags AB, Falun, both of, Sweden

Filed Apr. 6, 1984, Ser. No. 597,396
Claims priority, application Sweden, Apr. 21, 1983, 8302245
Int. Cl.[4] D21C *11/12, 11/00*
U.S. Cl. 162—30.1 **8 Claims**

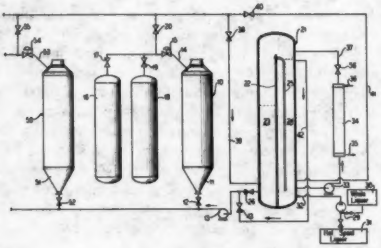


1. The method of recovering chemicals from waste liquor of wood pulp production, comprising in combination:
(a) feeding a pulp waster liquor of organic and inorganic constituents into a reaction zone of a reactor;
(b) heating the pulp waste liquor by means of a plasma generator which can raise the temperature of the reaction zone independently of the oxidation level in the reaction zone such that the pulp waste liquor is substantially completely vaporized and converted to a product mixture consisting essentially of sodium sulfide, sodium hydroxide, monatomic sodium, hydrogen, and carbon monoxide;
(c) cooling the product mixture in a cooling zone of the reactor;
(d) withdrawing the inorganic constituents of the pulp waste liquor as a white liquor melt or solution; and
(e) withdrawing the organic constituents as a combustible synthesis gas of hydrogen and carbon monoxide such that the organic constituents can be used to power a separate steam generator.

4,601,787
METHOD OF BRINGING A DIGESTER UP TO COOKING TEMPERATURE

Bertil K. E. Fagerlund, Järfälla, Sweden, assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 11, 1984, Ser. No. 599,142
Int. Cl.[4] D21C *7/10, 7/12, 7/14*
U.S. Cl. 162—45 **7 Claims**

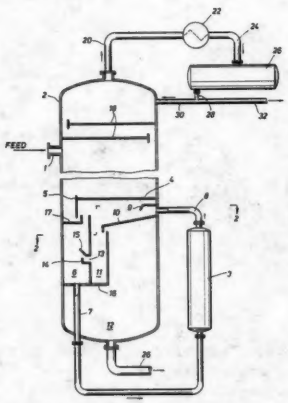


1. The method of bringing a digester up to cooking temperature efficiently and rapidly which comprises the following steps:
(1) packing wood chips into said digester,
(2) covering said chips with a hot spent liquor,
(3) displacing said hot spent liquor with a hot liquor displacing liquid from an alkali adjustment zone,
(4) after said hot spent liquor has been displaced, passing said hot liquor displacing liquid into a lower portion of said alkali adjustment zone,
(5) continuously circulating hot liquor from a constant volume heating zone into said alkali adjustment zone,
(6) continuously circulating hot liquor at the cooking temperature from the top of said heating zone into the bottom of said digester,
(7) continusouly circulating relatively cooler liquid after passage through said digester in step (6) from the top of said digester to the bottom of said heating zone,
(8) continuing circulation of said liquor as specified in steps (6) and (7) until the liquor leaving the top of said digester is at the cooking temperature,
(9) terminating the circulation as specified in step (8), and
(10) circulating the liquor in said heating section through a heat exchanger to raise the temperature of the liquor therein.

4,601,788
APPARATUS FOR FRACTIONATION REBOILING

Robert P. Bannon, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 397,640, Jul. 12, 1982, Pat. No. 4,490,215.
This application Jul. 19, 1984, Ser. No. 632,496
Int. Cl.[4] B01D *3/16*
U.S. Cl. 202—153 **6 Claims**



1. An apparatus for fractionating chemical compounds which comprises:
(a) an enclosed upright vessel having an upper end and a lower end and an internal volume,
(b) an inlet conduit communicating with said internal volume at a point intermediate the upper and lower ends of the vessel,
(c) a bottoms fraction outlet conduit communicating with a bottoms product compartment disposed within said internal volume at about the lower elevation of the vessel,
(d) a distillate outlet conduit communicating with said internal volume at the upper end of the vessel,
(e) vapor-liquid contacting means operatively distributed within the internal volume of said vessel,
(f) collecting means disposed below said vapor-liquid contacting means for passing substantially all of the downflow liquid from the bottom vapor liquid contacting means into a first liquid compartment,
(g) a first, reboiler feed, liquid compartment disposed within said vessel below the bottom vapor-liquid contacting

means to collect substantially all of the down flow from the bottom vapor-liquid collecting means,

(h) thermosyphon reboiling means operatively associated with the lower end of the vessel,

(i) means for removing liquid from said first liquid compartment and passing said liquid to the reboiler said means comprising a first condiut connected to the reboiler and to said first liquid compartment,

(j) a second, reboiler return, liquid compartment disposed within said vessel at an elevation overlapping that of the first compartment, to collect substantially all of the liquid from the reboiler to the vessel, and having means for fluid communication between said first compartment and said second compartment, said second compartment having liquid overlow means at an elevation above said fluid communication means for overflowing liquid from said second, reboiler return compartment into said bottom product compartment disposed in the lower end of the vessel, and

(k) means for passing fluid from the reboiler to the vessel, said means comprising a second conduit connected to the reboiler and to the outer wall of the vessel and being disposed to pass liquid to the upper part of said second liquid compartment.

4,601,789

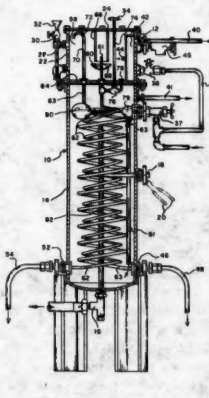
WATER PURIFICATION APPARATUS

John G. Bjorklund, 2127 Simpson Ave., Ocean City, N.J. 08226, assignor to John G. Bjorklund; Shirley W. Bjorklund; Leona House and Leonard J. House, all of Ocean City, N.J.

Continuation-in-part of Ser. No. 493,761, May 11, 1983, abandoned. This application Aug. 10, 1984, Ser. No. 639,782

Int. Cl.[4] B01D *3/02, 3/42*

U.S. Cl. 202—167 **10 Claims**



1. In a water distilling and hot water heating apparatus comprising a domestic hot water supply meas including a hot water tank, a feed means to the hot water tank and a withdrawal means from said tank, the improvement comprising:

(a) a water still means for holding water, leaving a vapor space above the water, comprising a closed container,

(b) a feed water supply means, for providing at the said still, water at a rate of flow in excess of the rate of flow of distilled water,

(c) a heating means to vaporizing the water in the container,

(d) a waste water exit port means for removing any liquid water accumulating above a water level in the container,

(e) a water vapor exit port means, positioned above the water level in the vapor space, for withdrawing water vapor from the said container,

(f) means connected to the water vapor exit port, and extending through a substantial length of the hot water tank, for conducting the water vapor and for transferring the heat of condensation of the water vapor from said still the water in the hot water tank, and

(g) means connected to the waste water exit port, and extending through a substantial length of the hot water tank, for transferring the latent heat of the waste water to the water in the hot water tank.

10. In a water distilling and hot water heating apparatus comprising a domestic hot water supply mean including a hot water tank, a feed means to the hot water tank and a withdrawal means from said tank, the improvement comprising:

(a) a still means comprising an enclosed first container, located at the top of the hot water tank for holding water, leaving a vapor space above a water level,

(b) a feed water supply means for providing a water at the said still at a rate of flow in excess of the rate of flow withdraw, as distilled water,

(c) a heating means for vaporizing the water in the first container,

(d) a volatile organic compound removing means for venting to the atmosphere the volatile organic compounds comprising a second container positioned in heat conduction communication with the water in the first container, and means for allowing the water to flow from the second container into the first container

(e) a waste water exit port means for removing any liquid water accumulating above a water level in the first container,

(f) a water vapor exit port means, positioned above the water level in the vapor space, for with drawing the water vapor,

(g) means connected to the water vapor exit port, and extending through a substantial length of the hot water tank, for conducting the water vapor and for transferring the heat of condensation of the water vapor from said still to the water in the hot water tank, and

(h) means connected to the waste water exit port, and extending through a substantial length of the hot water tank, for transferring the latent heat of the waste water to the water in the hot water tank.

4,601,790

PROCESS FOR DEODORIZING AND/OR PHYSICAL REFINING OF COCOA BUTTER AND COCOA BUTTER SUBSTITUTES

Hermann Stage, Ludgeristrasse 9, 4400 Münster, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,905

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3227669; Jun. 27, 1983, 3323120

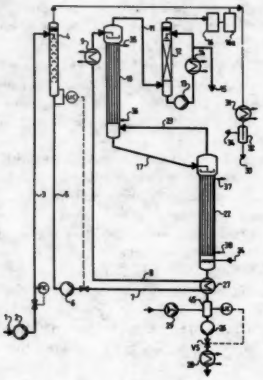
The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.[4] B01D *1/22;* **C09F** *5/10*

U.S. Cl. 203—6 **24 Claims**

1. A process for removing lower boiling components from at least one member selected from the group of cocoa butter, cocoa butter substitutes, or mixtures thereof; employing continuous countercurrent falling film stripping steam distillation in an externally imposed temperature field, which comprises heating said at least one member, causing said member, when heated in a liquid state, to flow down as a thin film having a film thickness of less than 1.0 mm along the walls of substantially vertically disposed surfaces forming trickle passages, maintaining at least a part of said passages at a higher temperature than that of the downflowing liquid, and passing steam countercurrently to said liquid through said trickle passages; which comprises providing at least two serially operating countercurrent falling film stripping steam distillation zones being in vapor and liquid communication with each other and providing an unrestricted vapor flow connection; and wherein the hydraulic equivalent diameters of the trickle passages in a final distillation zone downstream in the direction of the downflowing liquid are smaller than the hydraulic equivalent diame-

ters fo the trickle passages of the initial zone(s) located upstream of said final distillation zone; charging said at least one member to the top of the initial zone at a temperature ranging from 150° C. to 200° C.; maintaining the temperature of desired product in the bottom of the final distillation zone at a maximum of 10° K. in excess of the inlet temperature to the initial zone; and maintaining the inlet temperatures of the heating medium which is passed in countercurrent flow to the downflowing liquid film below 250° C. and a maximum of 10° K.



above the temperature of said desired product; maintaining the working pressure in the top of the initial zone below 2.0 mbar and maintaining the working pressure in the bottom of the final distillation zone no more than 1.6 mbar in ecess of that in the initial zone; providing liquid accumulators in the serially operating zones; and avoiding in the liquid accumulators of the serially operating zones, the formation of any significant liquid level; and supplying the stripping steam exclusively to the bottom of said final distillation zone in an amount of 2 kg to 10 kg of steam per 100 kg of charged liquid.

4,601,791

SEPARATION OF N-PROPANOL FROM ALLYL ALCOHOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and Mark G. Vosburgh, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Jul. 15, 1985, Ser. No. 755,302
Int. Cl.[4] B01D *3/40*
U.S. Cl. 203—51 **2 Claims**

1. A method for recovering n-propanol from a mixutre of n-propanol and allyl alcohol which comprises distilling a mixture of n-propanol and allyl alcohol in a rectification column in the presence of about one part of extractive agent per part of n-propanol-allyl alcohol mixture, recovering n-propanol as overhead product, obtaining the allyl alcohol and the extractive agent from the stillpot, separating the allyl alcohol from the extractive agent by distillation in another rectification column, wherein said extractive agent comprises at least one member of the group consisting of acetamide, N,N-dimethylacetamide, adiponitrile, dimethylformamide, dimethylsulfoxide and sulfolane.

4,601,792

METHOD FOR ELECTROANALYTICAL DETERMINATION OF ELECTROCHEMICALLY ACTIVE COMPOUNDS IN SOLUTION

Jiří Tenygl, Prague, Czechoslovakia, assignor to Ceskoslovanka Akademie Ved, Praha, Czechoslovakia

Filed Sep. 9, 1985, Ser. No. 774,247
Claims priority, application Czechoslovakia, Sep. 10, 1984, 6781-84
Int. Cl.[4] G01N *27/48*
U.S. Cl. 204—1 T **9 Claims**

1. A polarographic, voltametric, potentiometric and anodic method for electroanalytical determination of electrochemically active compounds in solution comprising the steps of:

extruding a mercury drop from a capillary tube and retracting the drop back toward the tube to generate a pulsating mercury drop which expands and contracts at a frequency of 0.1 to 100 cycles per second;

placing the pulsating mercury drop into a solution to be measured; and

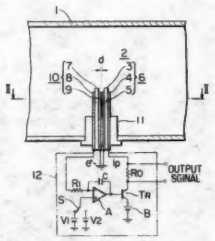
measuring the current potential of the pulsating drop against a reference electrode to determine the electrochemical activity of one or more components in solution.

4,601,793

SENSING AIR-TO-FUEL RATIO FOR ENGINE

Yoshiaki Asayama, Himeji, and Seiya Kominami, Takasago, both of Japan, assignors to NGK Spark Plug Co., Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

Division of Ser. No. 606,910, May 4, 1984. This application Aug. 28, 1985, Ser. No. 770,654
Claims priority, application Japan, May 11, 1983, 58-83588
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T **2 Claims**



1. A method of determining the air-to-fuel ratio A/F of an engine using a sensor unit mounted in the exhaust gas passage of the engine having a sensor and an oxygen pump separated by a gap, said oxygen pump comprising a solid electrolyte oxygen pump supplied with current from a source to control the partial pressure of oxygen in the gap, said sensor comprising a solid electrolyte oxygen sensor for producing electromotive force corresponding to the difference between the partial pressure of the oxygen in the gap and the partial pressure of the oxygen in the exhaust gas flowing through the passage outside of the gap, said method comprising the steps of:

introducing exhaust gas from the passage into the gap;

controlling the current Ip to said oxygen pump so as to maintain the electromotive force produced by said oxygen sensor at a first constant predetermined value higher than about 150 mV whereby the variation in the magnitude of the pump current Ip as a function of the air-to-fuel ratio A/F is increased in the vicinity of the stoichiometric A/F substantially in the manner represented by the characteristic curve b in FIG. 3;

altering the electromotive force produced by said oxygen sensor from said first constant predetermined value to a second constant predetermined value in the range of 20 mV to 70 mV whereby the variation in the magnitude of

the pump current Ip as a function of the air-to-fuel ratio A/F is substantially linear in both the lean and rich ranges in the manner represented by the characteristic curve a in FIG. 3; and

producing an output signal corresponding to the pump current Ip to said oxygen pump for sensing the air-to-fuel ratio A/F of the engine as said A/F ratio varies according to one of the different characteristic curves a and b corresponding to one of said first and second constant values of electromotive force.

4,601,794

METHOD AND APPARATUS FOR CONTINUOUS ELECTROPLATING OF ALLOYS

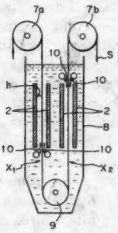
Tetsuaki Tsuda, Nishinomiya; Kazuo Asano, Ibaraki; Atsuyoshi Shibuya, Nagaokakyo; Minoru Nishihara, Kyoto; Kenichi Yanagi, Hiroshima; Mitsuo Kato, Hiroshima; Katsuhiko Yamada, Hiroshima, and Teijiro Fujisaka, Hiroshima, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sep. 6, 1984, Ser. No. 647,738

Claims priority, application Japan, Sep. 7, 1983, 58-165795; Dec. 8, 1983, 58-230610

Int. Cl.[4] C25D *5/04, 17/00, 21/10*

U.S. Cl. 204—15 **20 Claims**



1. In a continuous alloy electroplating apparatus including a vertical cell for a plating solution and insoluble anodes immersed in said plating solution, said insoluble anodes being vertically positioned on at least one side of and spaced from a strip running through a down-pass and an up-pass which are within the plating solution for defining the anode plating area, the improvement wherein said apparatus further includes a means for blowing the plating solution into the gap between the strip and each anode countercurrently with respect to the movement of the strip, said means being positioned in at least either one of said down-pass and up-pass at an end where the strip leaves said anode plating area defined by either pass, said means for blowing the plating solution being composed of a supply header in a conduit form which is positioned substantially parallel to the strip and transverse to the direction of its movement, a plurality of orifices which are formed in at least one row in the surface of said header in its longitudinal direction, an impingement plate that is positioned on said header parallel thereto and extends along the header in the longitudinal direction thereof and against which the plating solution squirted from said orifices impinges, and a guide plate positioned on the header at an angle with respect to the longitudinal direction thereof and which is arranged at a position between adjacent of said orifices.

8. In a method of continuously electroplating a metal strip of extended length with an alloy by continuously immersing said metal strip in a plating solution bath, said metal strip being immersed in said bath first in a downward and then in an upward directed run of the strip, the improvement comprising:

using an electroplating anode of an insoluble material which is located opposite at least one side of each of said downward and upward directed runs of the strip to form a gap falling substantially within a range of from 10 to 55 mm between said anode and each of said runs of the strip, an electroplated area of said strip being defined by a portion of each run of the strip facing said gap; and

blowing a plating solution at a predetermined rate into said gap in a direction substantially opposite to a movement of said strip in the run of the strip facing the gap, thereby forming a flow of the plating solution to the movement of the strip, said flow in a counter direction forming a substantially stable relative velocity with respect to said run of the strip facing the gap.

12. An apparatus for continuously electro-plating a metal strip of extended length with an alloy, comprising:

a vertical cell adapted for containing a plating solution;

means for forwarding and immersing the strip in said plating solution in said vertical cell, said means comprising means for forwarding the strip in the solution first in a downward directed run and then in an upward directed run of the strip;

an anode of an insoluble material opposing each of said downward and upward directed runs of the strip to form a gap in each of said downward and upward directed runs; and

blowing means for blowing a plating solution at a predetermined rate into said gap in a direction substantially opposite to a movement of said strip in the run of the strip facing the gap, thereby forming a flow of the plating solution of substantially stable relative velocity with respect to said run of the strip facing the gap, said blowing means being positioned at an end of at least one of the gaps at which end the strip leaves said electroplated area.

4,601,795

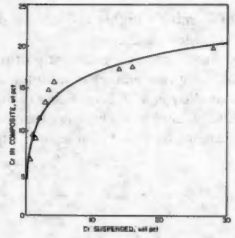
ALLOY COATING METHOD

Gerald R. Smith, Columbia, and John E. Allison, Jr., Bowie, both of Md., assignors to The United States of America as represented by Secretary of Interior, Washington, D.C.

Filed Mar. 27, 1985, Ser. No. 716,789

Int. Cl.[4] C25D *5/50, 15/00*

U.S. Cl. 204—16 **12 Claims**



1. A method of coating a metal substrate with a ternary or greater alloy of a predetermined composition comprising the steps of:

determining the control parameters which are the concentrations of the metals to be deposited in the electrolyte and the current density of the matrix structure of the alloy to be electrodeposited;

electrodepositing first and second metals on the substrate using an aqueous electrolyte in accordance with the control parameters;

mixing a metal powder in the electrolyte as the first and second metals are electrodeposited such that a portion of the metal powder is occluded to form an electrodeposited metal coating;

controlling the volume percent of the metal powder in the electrolyte and the percentage of reducible ions in accordance with the control parameter of the determined ma-

trix structure to cause the metal powder to occlude with the first and second metals at a desired rate; and

heat treating the metal coating to diffuse the occluded metal powder in the coating and to thereby form the desired alloy coating.

4,601,796

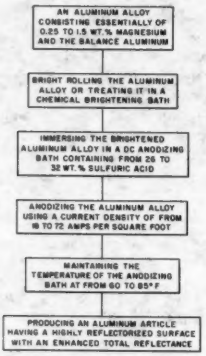
HIGH REFLECTANCE SEMI-SPECULAR ANODIZED ALUMINUM ALLOY PRODUCT AND METHOD OF FORMING SAME

John H. Powers, Lower Burrell, and Hang T. Dang, Plum Boro, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 651,912, Sep. 19, 1984, which is a continuation of Ser. No. 590,323, Mar. 16, 1984, Pat. No. 4,483,750. This application Jul. 15, 1985, Ser. No. 754,573

Int. Cl.[4] C25D *5/44*

U.S. Cl. 204—33 **22 Claims**


AN ALUMINUM ALLOY CONSISTING ESSENTIALLY OF 0.25 TO 1.5 WT.% MAGNESIUM AND THE BALANCE ALUMINUM
BRIGHT ROLLING THE ALUMINUM ALLOY OR TREATING IT IN A CHEMICAL BRIGHTENING BATH
IMMERSING THE BRIGHTENED ALUMINUM ALLOY IN A DC ANODIZING BATH CONTAINING FROM 26 TO 32 WT.% SULFURIC ACID
ANODIZING THE ALUMINUM ALLOY USING A CURRENT DENSITY OF FROM 18 TO 72 AMPS PER SQUARE FOOT
MAINTAINING THE TEMPERATURE OF THE ANODIZING BATH AT FROM 60 TO 85°F
PRODUCING AN ALUMINUM ARTICLE HAVING A HIGHLY REFLECTORIZED SURFACE WITH AN ENHANCED TOTAL REFLECTANCE

16. A method of forming a highly reflective anodized aluminum alloy product which comprises:

(a) forming an alloy consisting essentially of 0.25 to 1.5 wt. % magnesium with the balance aluminum; and

(b) anodizing said alloy in a DC anodizing bath containing at least 26% sulfuric acid at a current density of at least 18 amperes per square foot and at a temperature of at least 60° F.

4,601,797

ELECTROCHEMICAL CARBOXYLATION OF ISOBUTYLACETOPHENONE AND OTHER ARYL KETONES

John H. Wagenknecht, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 683,542, Dec. 19, 1984. This application Mar. 1, 1985, Ser. No. 707,260

Int. Cl.[4] C25C *1/00;* **C25D** *3/00*

U.S. Cl. 204—59 R **21 Claims**

1. A process of preparing a carboxylation product convertible to a 2-aryl-2-hydroxypropionic acid by treatment with acid which comprises electrolyzing at at cathode an aryl methyl ketone in the presence of carbon dioxide in an electrolysis medium comprising organic solvent and supporting electrolyte to effect addition of carbon dioxide to the aryl methyl ketone, with the aryl group being selected from p-isobutylphenyl, 6-chlorocarbazyl-2, 3-phenoxyphenyl, 2-iospropylindanyl-5, 2-fluoryl, 2-fluoro-4-biphenylyl, and 6-methoxynaphthyl-2.

4,601,798

CONTINUOUS PREPARATION OF SILANE, SiH_4

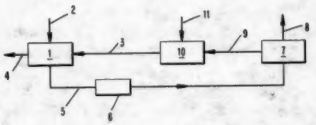
Serge Jacubert, Viroflay; Jean Grosbois, L'Isle Adam, and Jean-Michel Verdier, Paris, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Aug. 30, 1983, Ser. No. 527,869

Claims priority, application France, Aug. 31, 1982, 82 14863

Int. Cl.[4] C25B *1/02, 15/08*

U.S. Cl. 204—61 **17 Claims**



1. A continuous integrated process for the preparation of silane, comprising continuously (i) reacting a chlorosilane with lithium hydride recycled in a base mixture of molten salts comprising lithium chloride and at least one other alkali or alkaline earth metal chloride, in a discrete first reaction zone, (ii) recovering silane product from said first reaction zone, (iii) cycling the silane depleted product of reaction from said first reaction zone, which comprises said base mixture and the additional amounts of LiCl produced in said first reaction zone, to a discrete electrolysis second reaction zone, (iv) electrolyzing lithium chloride comprising said first zone reaction product in said electrolysis second reaction zone, (v) recovering chlorine gas from said electrolysis second reaction zone, (vi) cycling the chlorine depleted product of electrolysis from said second reaction zone, which comprises said base mixture and lithium metal produced in said electrolysis second reaction zone, to a discrete hydrogenation third reaction zone, (vii) hydrogenating the lithium metal comprising said second zone reaction product in said hydrogenation third reaction zone, and (viii) recycling the product of reaction from said hydrogenation third reaction zone, which comprises said base mixture and the first zone reactant lithium hydride produced in said hydrogenation third reaction zone, to said first reaction zone.

4,601,799

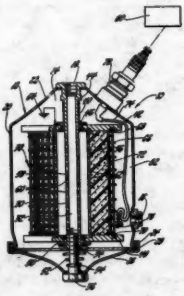
ELECTRIC FIELD OIL FILTER AND METHOD OF FILTERING

Charles F. Froberger, Mt. Clemens, and James A. Spearot, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 412,134, Aug. 27, 1982, abandoned. This application Jun. 28, 1984, Ser. No. 625,517

Int. Cl.[4] B01D *35/06*

U.S. Cl. 204—181.8 **17 Claims**



12. The method of separating dispersed particles of soot or

the like from oil in which the particles are dispersed, the soot particles being in a size range of about 0.005 micron to 1.0 micron in diameter, said method comprising the steps of:

(1) providing a filter assembly having a first electrode and a second electrode in serially spaced flow relation at a substantially constant separation distance, the provided electrodes each having openings therethrough in the range of from about 0.0725 inch to 0.5 inch diameter or width and breadth;

(2) flowing oil into the filter assembly and through the first electrode openings with particles therein to be separated being dispersed in the oil flowing into the filter assembly;

(3) establishing and maintaining a D.C. electrical potential between the first and second electrodes within a range of about 250 to 2,000 volts D.C. per millimeter of electrode separation;.

(4) by the established and maintained D.C. electrical potential attracting soot particles, dispersed in the oil flowing into the filter assembly, toward the first electrode and coagulating the particles so attracted into masses of particles larger than the openings in the first and second electrodes;

(5) and retaining the coagulated masses of particles within the filter assembly by coaction of at least one of the electrodes and the coagulated masses of particles while flowing the oil through the second electrode openings and out of the filter assembly.

4,601,800

PREPARATION OF AQUEOUS SOLUTIONS OF HYDROXYLAMMONIUM CARBONATE

Franz-Josef Weiss, Neuhofen; Wolfgang Habermann, Mainz; Peter Hammes, Ruppertsberg; Josef Ritz, Ludwigshafen; Erwin Thomas, Freinsheim, and Peter Thoma, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 24, 1984, Ser. No. 685,255

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347258

Int. Cl.[4] B01D *57/02;* **C25C** *7/00*

U.S. Cl. 204—182.4 **12 Claims**

1. A process for the preparation of an aqueous solution of hydroxylammonium carbonate from an aqueous hydroxylammonium salt solution of electrodialysis, the aqueous hydroxylammonium salt solution being fed into the middle zone of an electrolysis cell which is divided into a cathode zone, an anode zone and a middle zone by means of semipermeable membranes, and being electrolyzed, wherein the catholyte used is an aqueous solution of an ammonium carbonate or an alkali metal carbonate or of one of the corresponding bicarbonates, and wherein the catholyte further contains ammonia and/or an amine.

4,601,801

VERTICAL TYPE ELECTRO-GALVANIZING APPARATUS

Shuzo Fukuda; Yutaka Ohkubo; Toshio Ishii; Masaru Sagiyama, all of Yokohama, and Akira Tonouchi, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,223

Claims priority, application Japan, Jul. 31, 1984, 59-159087

Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—206 **3 Claims**

1. A vertical type electro-galvanizing apparatus, which comprises:

a vertical type electro-galvanizing tank for receiving an electro-galvanizing bath;

a first conductor roll, arranged above a steel strip inlet side of said electro-galvanizing tank, for substantially vertically directing a steel strip downwardly into said electro-galvanizing tank and applying electricity to said steel strip;

at least one sink roll, arranged in said electro-galvanizing tank, for upwardly reversing the travelling direction of said steel strip directed into said electro-galvanizing tank;

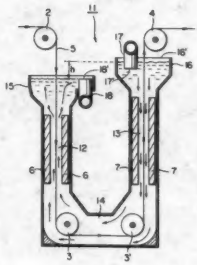
a second conductor roll, arranged above a steel strip outlet side of said electro-galvanizing tank, for substantially vertically directing said steel strip upwardly from said electro-galvanizing tank and applying electricity to said steel strip;

at least one first electrode plate for electro-galvanizing at least one of the surfaces of said steel strip, which is arranged in said electro-galvanizing tank between said first conductor roll and said at least one sink roll substantially in parallel with said steel strip travelling downwardly through said electro-galvanizing tank;

at least one second electrode plate for electro-galvanizing at least one of the surfaces of said steel strip, which is arranged in said electro-galvanizing tank between said at least one sink roll and said second conductor roll substantially in parallel with said steel strip travelling upwardly through said electro-galvanizing tank;

an electro-galvanizing solution supply means for supplying an electro-galvanizing solution into said electro-galvanizing tank to form an electro-galvanizing bath therein, and forming a flow at a prescribed flow velocity of said electro-galvanizing bath between said at least one first electrode plate and said steel strip travelling downwardly and between said at least one second electrode plate and said steel strip travelling upwardly; and

at least one electro-galvanizing bath discharge means, provided at a top portion of said electro-galvanizing tank, for causing overflow of said electro-galvanizing bath in said electro-galvanizing tank;



characterized in that:

said vertical type electro-galvanizing tank **(11)** comprises a U-shaped electro-galvanizing tank including a first vertical path **(12)** at a steel strip inlet side, a second vertical path **(13)** at a steel strip outlet side and a horizontal path **(14)** for communicating the lower end of said first vertical path **(12)** with the lower end of said second vertical path **(13)**, said first vertical path **(12)** and said second vertical path **(13)** having the same cross-sectional area, said steel strip **(5)** passing sequentially through said first vertical path **(12)**, said horizontal path **(14)** and said second vertical path **(13)**;

said first conductor roll **(2)** is arranged above said first vertical path **(12)**;

said at least one sink roll **(3, 3')** is arranged in said horizontal path **(14)**;

said second conductor roll **(4)** is arranged above said second vertical path **(13)**;

said at least one first electrode plate **(6, 6)** is arranged in said first vertical path **(12)** substantially in parallel with said steel strip **(5)** travelling downwardly through said first vertical path **(12)**;

said at least one second electrode plate **(7, 7)** is arranged in said second vertical path **(13)** substantially in parallel with

said steel strip (5) travelling upwardly through said second vertical path (13);

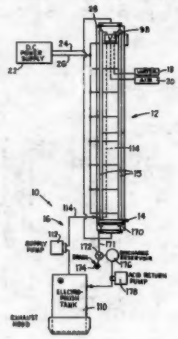
said electro-galvanizing solution supply means comprises an electro-galvanizing solution supply pipe (17) arranged at at least one of a top portion (15) of said first vertical path (12) and a top portion (16) of said second vertical path (13), the lower portion of said electro-galvanizing solution supply pipe (17) being immersed into said electro-galvanizing bath in at least one of said top portions (15, 16) during operation; and

said at least one electro-galvanizing bath discharge means comprises at least one electro-galvanizing bath discharge pipe (18) arranged at at least one of said top portion (15) of said first vertical path (12) and said top portion (16) of said second vertical path (13).

4,601,802
APPARATUS FOR INTERNALLY ELECTROPOLISHING TUBES

Thomas L. Grimes; Robert Roeland, both of Kalamazoo, and Frederic H. Schadewald, Richland, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 31, 1984, Ser. No. 636,198
Int. Cl.[4] C25F *7/00*
U.S. Cl. 204—212 23 Claims



1. Apparatus for electropolishing the interior of elongate tubes comprising:

a table;

means on said table for rotatably supporting in side-by-side relation plural substantially horizontal elongate tubes to be interiorly electropolished, said means engaging axially spaced portions of said side-by-side tubes;

a plurality of bearing units fixed side by side on said table with each including a pair of axially spaced bearings, and side-by-side sleeve units carried rotatably by corresponding bearing pairs and releasably gripping therein side-by-side ones of said tubes;

means including a drive member positively driving said sleeves between the spaced bearings of each pair for rotatably driving said tubes in synchronism;

cathode rods and means supporting a said cathode rod in each tube;

DC electrical supply means having positive and negative terminals electrically connected respectively to said tubes and cathode rods;

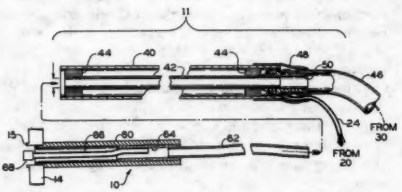
manifold means for simultaneously feeding electrolyte liquid to the input end of said rotating tubes; and

means horizontally spaced from said manifold means and at the outlet end of said rotating tubes for receiving liquid electrolyte therefrom.

4,601,803
ELECTROCHEMICAL MACHINING TECHNIQUE AND APPARATUS

Barry W. Gregory, Hebron, Conn., assignor to J. T. Slocomb Co., S. Glastonbury, Conn.

Filed Feb. 11, 1985, Ser. No. 700,264
Int. Cl.[4] B23P *1/02*; C25D *17/10*
U.S. Cl. 204—224 M 12 Claims



1. In an electrochemical machining apparatus, the apparatus including a source of electrolyte under pressure and a source of electrical current having a pair of terminals to which opposite polarity voltages are applied, the apparatus also including a container in which an electrically conductive workpiece to be machined is supported, the workpiece being electrically connected to a first terminal of the current source, an improved stylus comprising:

tubular handle means, said handle means having an outer member comprised of non-conductive material, said handle means further having a first tubular conductor supported within and coaxial with said outer member;

means establishing a fluid tight connection between the source of electrolyte and the interior of said handle means first tubular conductor whereby electrolyte will flow through said first tubular conductor;

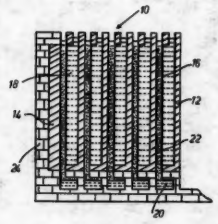
means establishing an electrical connection between said handle means first tubular conductor and the second terminal of the current source; and

tip means, said tip means having first and second ends and defining an electrolyte discharge port adjacent the first end thereof, said tip means including an elongated second tubular conductor having oppositely disposed first and second ends, said second tubular conductor having an axis and an outer diameter which is substantially equal to the inner diameter of said first tubular conductor, said second tubular conductor being provided intermediate said first and second ends thereof with a region wherein at least a portion of the wall surface which defines said outer diameter is displaced from said axis by a greater distance than the said wall surface of said second tubular conductor to either side of said region, said second conductor having a preselected resiliency in a direction transverse to its axis, said tip means further including an electrode defining member located in the vicinity of said discharge port, said electrode defining member being electrically connected to said second tubular conductor, an electrolyte flow path between the soruce of electrolyte and said electrolyte discharge port being defined by said first and second tubular conductors, the second terminal of the current source being electrically connected to said electrode defining member by said first and second tubular conductors whereby current may flow through the electrolyte between the workpiece and said electrode defining member.

4,601,804
CELL FOR ELECTROLYTIC PURIFICATION OF ALUMINUM

Sylvestre Viré , Neuhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 12, 1984, Ser. No. 630,289
Claims priority, application Switzerland, Jul. 27, 1983, 4131/83
Int. Cl.[4] C25C *3/08, 3/18, 3/22, 3/24*
U.S. Cl. 204—244 11 Claims



1. A thermally insulated cell for the electrolytic purification of aluminum, comprising a trough having a steel shell surrounded by an outer wall, said trough being provided with a lining of high temperature electrolyte resistant material; a lid for closing off said trough; segregation wells for feeding impure aluminum to the cell and precipitating out crystals of impurity elements; means for supplying an electrolyte material having alkali chlorides as its base to said trough and also for withdrawing waste gases therefrom; and a collection and run-off system for collecting the purified aluminum, wherein a plurality of bipolar electrode units are immersed in the cell interior in the electrolyte where the said electrode units are connected in series and each have

(1) a graphite frame which is vessel-shaped and has an open face facing in the direction of the end of a graphite cathode and a flat surface facing in the direction of the end of a graphite anode;

(2) a porous diaphragm plate which closes over and seals the opening in the graphite frame and which is wettable by the molten electrolyte but not by aluminum, and has its porous structure full of the electrolyte; and

(3) a separate segregation well for feeding aluminum which is to be purified and for precipitating out impurity crystals; the said plurality of electrode units being arranged at a regular spacing (d), the interpolar distance between the inner side of the diaphragm plate and the cathodic frame, parallel to each other and to the end graphite anode having an anodic current connection, and also to the end graphite cathode having a cathodic current connection and such that the height (H) of the volume for the aluminum which is to be purified, enclosed by the graphite frame and diaphragm plate, is of such a dimension that when the said volume is full the static pressure is lower than the critical value to penetrate the porous diaphragm plate.

4,601,805
APPARATUS FOR PREPARING METAL BY ELECTROLYSIS

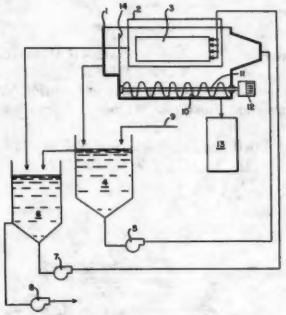
Claude Palvadeau, Breuillet, and Claude Scheidt, Issy-les-Moulineaux, both of France, assignors to Societe Miniere et Metallurgique de Penarroya, Paris, France

Division of Ser. No. 492,443, May 6, 1983, Pat. No. 4,507,182.
This application Nov. 26, 1984, Ser. No. 674,668
Claims priority, application France, May 6, 1982, 82 07940
Int. Cl.[4] C25C *7/08;* C25B *11/10, 11/12*
U.S. Cl. 204—255 22 Claims

1. Apparatus for the preparation of metal by electrolysis comprising pump means for supplying electrolyte to a cell;

a cell having a diaphragm, an anode and a planar surface cathode;

said cathode being formed of a material selected from the group consisting of titanium, stainless steel and graphite with said material having a density of nucleation sites such that metallic particles formed thereon obtain a size of at least 100 micrometers without sticking to adjacent metallic particles;



said cathode being vertically disposed in said apparatus and cooperating therewith so that electrolyte is caused to flow parallel to and along the length of said planar surfaces;

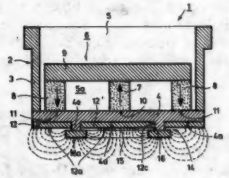
said pump circulating the electrolyte at a laminar to weakly turbulent flow rate so that the flow of electrolyte and the weight of said metallic particles of said size enables said particles to be dislodged from said cathode and fall to the bottom of the cell; and

means for withdrawing the solid particles from the bottom of said cell.

4,601,806
MAGNETRON CATHODE FOR SPUTTERING FERROMAGNETIC TARGETS

Peter Wirz, Waldernbach, Fed. Rep. of Germany, assignor to Hans Zapfe, Rodgau, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,239
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, 3343875
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 3 Claims



1. In a magnetron cathode for the sputtering of targets of ferromagnetic materials, consisting of a cathode ground body having at least one supporting surface for the target, a magnet system having magnet poles of opposite polarity cohering on the circumference, situated one within the other, and separated by an interstice, the target being divided by at least one air gap geometrically similar to the configuration of the interstice into at least two target parts which are staggered in the direction of the depth of the cathode on at least one supporting surface, and wherein the magnet system is disposed behind the farthest set-back supporting surface for the said target parts and the width "s" of the air gap in the direction of the depth of the said

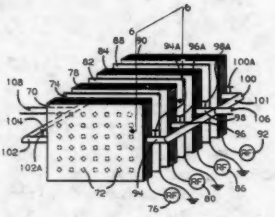
cathode is smaller than the dark space interval required under operating conditions, the improvement which comprises providing step-wise divisions of the said supporting surface by nonferromagnetic but electrically conductive projections such that there are at least three target parts disposed on individual steps, and such that the projections extend over the sputtering surfaces of the farthest set-back cathode parts only to such an extent that the width of the said air gaps is smaller than the dark space intervals necessary under operating conditions.

4,601,807

REACTOR FOR PLASMA DESMEAR OF HIGH ASPECT RATIO HOLE

John C. Lo, and Neng-hsing Lu, both of Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1985, Ser. No. 692,143
Int. Cl.[4] C23F *1/00*; B44C *1/22*
U.S. Cl. 204—298 **16 Claims**



1. In a plasma reactor chamber, a system for generating uniform gas flow comprising:

(a) a first hollow electrode disposed in said chamber, said electrode having two major surfaces, each of said major surfaces having a plurality of apertures therein;

(b) a second hollow electrode disposed in said chamber opposite said first electrode, said second electrode having two major surfaces, each of said major surfaces having a plurality of apertures therein;

(c) a first radio frequency power source operatively connected to said first electrode for generating an electrical field;

(d) a second radio frequency power source operatively connected to said second electrode for generating an electrical field;

(e) means for supporting a substrate intermediate said first and second electrodes; and

(f) means for introducing a gas to be converted into a reactive species by said radio frequency electrical field through said electrodes, said electrodes being adapted to distribute gas uniformly across the substrate.

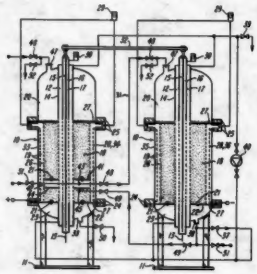
4,601,808

APPARATUS FOR DESALTING WATER BY ELECTRODIALYSIS

Hanns-Heinz Eumann, Lerchenweg 1, D-7034 Gärtringen, and Winfried Blank, Gäufelden, both of Fed. Rep. of Germany, assignors to Hanns-Heinz Eumann, Gärtringen, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 731,067
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418102; Nov. 13, 1984, 3441419
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—301 **8 Claims**

1. In an apparatus for desalting water by electrodialysis, where said apparatus includes a circular cylindrical tank having an wall and a central longitudinal axis, where provided in said tank are a central electrode which extends along said central longitudinal axis of said tank, a first electrode chamber which is coaxial to said central electrode and embeds the latter in electrolyte solution, a resin chamber which is coaxial to said central electrode and contains ion exchange resin, and a brine chamber which is coaxial to said central electrode, and where the separation of adjoining chambers is effected by respective membranse, which are permeable either to cations or to anions, the improvement wherein:



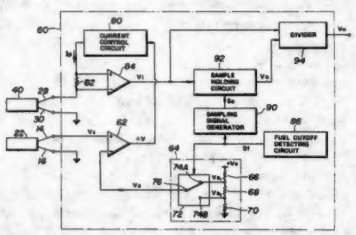
said brine chamber is disposed between said first electrode chamber and said resin chamber, and a hollow cylindrical second electrode chamber, which is designed for receiving another electrolyte solution, is disposed between said resin chamber and said wall of said tank.

4,601,809

OXYGEN CONCENTRATION DETECTING SYSTEM USING OXYGEN SENSOR INCLUDING OXYGEN ION PUMP

Tsuyoshi Kitahara, Ina, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 15, 1985, Ser. No. 723,298
Claims priority, application Japan, Apr. 16, 1984, 59-75063
Int. Cl.[4] G01N *27/56*
U.S. Cl. 204—406 **19 Claims**



1. A system for detecting the concentration of oxygen in a gas, comprising:

an oxygen sensor comprising gas admitting means for admitting a fraction of a gas subject to inspection, diffusion restricting means for offering a resistance to the inflow of said gas into said gas admitting means, a first solid electrolyte cell which comprises a layer of an oxygen ion conductive solid electrolyte with its one surface exposed to a preselected gas and the opposite surface exposed to a gas in said gas admitting means and produces an electrical output representing a difference between a partial pressure of oxygen of said preselected gas and a partial pressure of oxygen of the gas in said gas admitting means, and a second solid electrolyte cell which comprises a body of an oxygen ion conductive solid electrolyte and a pair of electrodes arranged such that an externally supplied DC

current flows in the solid electrolyte body to cause migration of oxygen ions through the solid electrolyte body and controls the magnitude of the partial pressure of oxygen in a gas in said gas admitting means in dependence on the intensity of said current;

current supply means for supplying said DC current to said second solid electrolyte cell and controlling said current so as to render said output of said first solid electrolyte cell equal to a predetermined target value;

measurement means for detecting the intensity of said current and producing a provisional output signal representing the detected current intensity;

atmospheric condition determining means for continually making a determination whether the gas in said admitting means is equivalent to the atmospheric air or not and producing an electrical signal indicating the result of the determination;

shift means for varying said target value in response to said signal produced by said determining means such that when said signal produced by said determining means indicates that the gas in said gas admitting means is equivalent to the atmospheric air the intensity of said current becomes lower than the intensity of the same current required if the target value is not varied under the same atmospheric condition; and

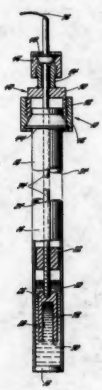
correction means for correcting said provisional output signal based on the value of said provisional output signal produced when the gas in said gas admitting means is determined equivalent to the atmospheric air and thereby producing an output signal representing the concentration of oxygen in the gas subject to inspection.

4,601,810

ELECTROCHEMICAL PROBE FOR MEASURING MAGNESIUM CONCENTRATION IN MOLTEN ALUMINUM

Basant L. Tiwari, Sterling Heights, and Blake J. Howie, Romeo, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 3, 1985, Ser. No. 783,361
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—413 **3 Claims**



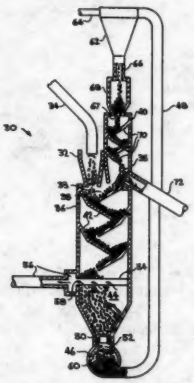
1. An electrochemical cell adapted for immersion in a melt of Al alloy containing small quantities of Mg for determining the concentration of said Mg in said melt comprising: an impervious housing which is substantially inert to molten Al; a cavity in said housing; an opening in said housing communicating said cavity with said melt when immersed therein; a porous ceramic electrolyte-wettable frit sealed in said opening; a pool of molten salt magnesium-ion-containing electrolyte filling the pores of said frit and a portion of said cavity; capsule means immersed in said electrolyte; a pocket within said capsule; said capsule having an aperture therein submerged beneath said electrolyte and communicating said pocket with said electrolyte; a Mg-rich reference electrode material contained within said pocket out of contact with said housing and in direct communication with said electrolyte via said aperture, said material consisting essentially of magnesium; electrical lead means engaging said reference material for conducting current from said material externally of said housing; conductor means connected to said lead means for immersion in said melt; and means for measuring the electrochemical potential between said conductor means and said reference material for comparison to a predetermined calibration graph prepared with said reference material from known concentrations of Mg in Al alloys.

4,601,811

PROCESS FOR OIL SHALE RETORTING USING GRAVITY-DRIVEN SOLIDS FLOW AND SOLID-SOLID HEAT EXCHANGE

Arthur E. Lewis, Los Altos; Robert L. Braun, Livermore; Richard G. Mallon, Livermore, and Otis R. Walton, Livermore, all of Calif., assignors to The United States of America as represented by United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 534,472, Sep. 21, 1983, abandoned, which is a division of Ser. No. 636,960, Aug. 2, 1984. This application Nov. 6, 1984, Ser. No. 668,688
Int. Cl.[4] C10G *1/00*; C10B *53/06*
U.S. Cl. 208—410 **10 Claims**



1. A method for retorting oil shale, wherein the oil shale particles are not uniform in size, and can include fines, comprising:

burning residual char in particles of spent shale to heat the shale to a temperature greater than the pyrolysis temperature of raw shale;

producing a continuous cascading gravity-flow of a non-fluidized layer of particles of cold raw shale and hot burned shale;

segregating the particles by size in the flowing layer with smaller particles moving to the bottom of the layer and larger particles to the top;

inverting the layer of particles so that the smaller particles are on the top of the layer and larger particles on the bottom;

wherein the steps of producing a flowing layer, segregating the particles in the layer and inverting the layer are produced by flowing the particles down a series of down-

wardly sloped alternately opposed stationary baffles comprising a first segment having a slope, measured from the horizontal, in the range of about 24°–60° and a second segment joined to and above the first segment, the slope of the second segment being greater than the slope of the first segment, the series of baffles being arranged so that the lower tip of one baffle extends laterally to and above about the junction between the first and second segments of the next baffle;

repeating the steps of segregating the particles in the layer and inverting the layer a sufficient number of times in a period of time of less than about 30 seconds to produce intimate mixing of the particles in the layer which allows later heat transfer to raise the temperature of the raw shale to the pyrolysis temperature; and

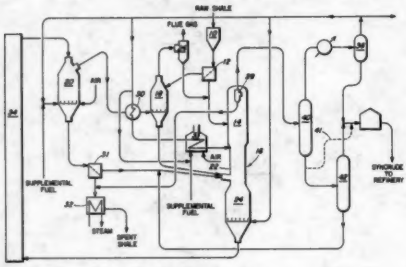
producing a continuously moving packed-bed of the heated shale mixture after mixing has occurred, for a sufficient time to produce substantially total heat sharing in the mixture to raise the temperature of the raw shale to the pyrolysis temperature and to allow complete pyrolysis to occur.

4,601,812

OIL SHALE RETORTING PROCESS

Ardis L. Anderson, and James R. McConaghy, Jr., both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 7, 1985, Ser. No. 689,108
Int. Cl.[4] C10G *1/00;* C10B *53/06*
U.S. Cl. 208—410 **3 Claims**



1. A process for producing syncrude from oil shale comprising:

(a) providing a particulate oil shale feed comprised of at least 75 percent by weight of plus 4 mesh particles;

(b) separating said oil shale feed into a fines fraction and a crushed shale fraction;

(c) preheating said crushed shale fraction;

(d) feeding said preheated shale fraction to a reduced diameter center section of a retort vessel;

(e) feeding said fines fraction into a disengaging section of said retort vessel, said disengaging section being above said center section and having gas flowing upwardly therein at or above the gas velocity just above the shale feed point, but below the rate at which substantial fluidization of solids occur;

(f) retorting said preheated shale fraction in a gravity flow retorting section of said retort vessel, said retorting section being below said center section and having a larger diameter than said center section;

(g) feeding retorted shale from said retorting section to a combustor to produce hot spent shale and hot combustion gases;

(h) utilizing said hot combustion gases to preheat the crushed shale in preheating step (c);

(i) combining said hot spent shale with said preheated shale fraction being fed to said retort vessel in an amount sufficient to provide retorting heat;

(j) separately recovering retort vapors and separated fines from said disengaging section; and

(k) recovering a syncrude from said retort vapors.

4,601,813

PROCESS FOR PRODUCING OPTICALLY ANISOTROPIC CARBONACEOUS PITCH

Takayuki Izumi, Oi; Tsutomu Naito, Saitama; Masuo Shinya, Oi, and Tomio Nomura, Higashi-Matsuyama, all of Japan, assignors to Toa Wenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1982, Ser. No. 412,321
Claims priority, application Japan, Aug. 28, 1981, 56-135296
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.
Int. Cl.[4] C01C *3/00;* D01F *9/12, 9/20*
U.S. Cl. 208—22 **23 Claims**

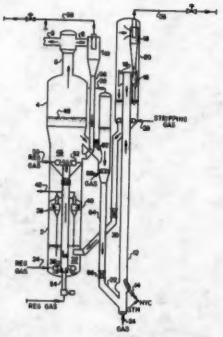
1. A process for producing a homogeneous, optically anisotropic carbonaceous pitch having a low softening point used for the production of a carbon material comprising subjecting a starting material of heavy tarlike or pitch-like substance to thermal decomposition polycondensation, wherein the starting material is a mixture of compounds containing substantially no chloroform insolubles but containing components having a boiling point of at least 540° C. as principal components and consisting principally of carbon and hydrogen; the starting material containing a n-heptane soluble component having an aromatic oil fraction and a resin fraction as principle components; the aromatic oil fraction and resin fraction having a aromatic carbon fraction fa of at least 0.7, a number-average molecular weight of up to 1,000 and a maximum molecular weight of up to 2,000.

4,601,814

METHOD AND APPARATUS FOR CRACKING RESIDUAL OILS

Jean-Louis Mauleon, Aurora, and Robert J. Newman, Englewood, both of Colo., assignors to Total Engineering and Research Company, Denver, Colo.

Filed May 27, 1983, Ser. No. 498,883
Int. Cl.[4] C10G *11/18;* B01J *8/24, 8/22*
U.S. Cl. 208—113 **14 Claims**



1. A method for converting a residual portion of crude oil with high temperature fluid catalyst particles which comprises,

(a) flowing a suspension of high temperature fluid catalyst particles upwardly through a riser conversion zone,

(b) atomizing a residual oil feed to be converted to a droplet size commensurate with or smaller than the high tempera-

ture suspended catalyst particles of a size in the range of 20 to 200 microns,

(c) charging the atomized residual oil of (b) at a velocity in the range of 300 to 1300 ft./sec. into contact with said upwardly flowing hot catalyst particle suspension initially at a temperature at least equal to or above the residual oil feed pseudo critical temperature,

(d) the temperature of contact between said catalyst particles and said atomized residual oil feed initially sufficiently elevated to shatter asphalt component in said residual oil and obtain up to 50 percent thermal conversion of the atomized oil feed, effecting catalytic conversion of oil vapors formed in said upflowing suspension thereby reducing the temperature of the suspension, and

(e) separating vaporous hydrocarbon conversion products of step (d) from catalyst particles following traverse of said riser zone in a time frame less than about 2 seconds.

4,601,815

PASSIVATION OF FCC CATALYSTS

David R. Forester, The Woodlands, and Raymon C. Barlow, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 27, 1984, Ser. No. 686,859
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 **10 Claims**

1. In a process comprising:

(a) contacting a hydrocarbon feedstock with a fluidized zeolite-containing cracking catalyst in a cracking zone under cracking conditions;

(b) recovering the cracked product;

(c) passing the cracking catalyst from the cracking zone to a regeneration zone;

(d) regenerating the cracking catalyst in the regeneration zone by contact with oxygen-containing gas under regeneration conditions to produce a regenerated catalyst; and

(e) introducing the regenerated catalyst to the cracking zone for contact with the hydrocarbon feedstock;

wherein the catalyst during the cracking process is eventually contaminated with from about 500 to 10,000 parts per million parts of catalyst with vanadium contained in the feedstock, which vanadium would at regeneration temperatures and conditions affect the catalyst in a manner which would detrimentally affect its efficiency upon being reintroduced to said cracking zone for reuse;

the improvement comprising treating the vanadium contaminated cracking catalyst prior to its reaching equilibrium and prior to the subjection thereof to regeneration temperatures with a material consisting essentially of tin or a source thereof, the amount of tin utilized being from 1 to 1999 ppm of catalyst.

4,601,816

UPGRADING HEAVY HYDROCARBON OILS USING SODIUM HYPOCHLORITE

Lillian A. Rankel, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1984, Ser. No. 639,058
Int. Cl.[4] C10G *29/04*
U.S. Cl. 208—253 **20 Claims**

1. A process for demetallizing a residual hydrocarbon fraction comprising:

(a) contacting said hydrocarbon fraction with an aqueous solution of a hypochlorite salt;

(b) separating the mixture into an aqueous phase and an oil phase;

(c) contacting the oil phase with a deasphalting solvent and

(d) obtaining by separation a product comprising a demetallized oil fraction suitable for use as a feedstock for catalytic processing.

4,601,817

TREATMENT OF HAZARDOUS MATERIALS

Alfred R. Globus, 26-53 210th St., Bayside, N.Y. 11360

Filed Sep. 21, 1984, Ser. No. 652,898
Int. Cl.[4] C10G *17/00*; C07C *1/20*
U.S. Cl. 208—262 **9 Claims**

1. Process for removing halogentated hydrocarbon from a material containing the same which comprises: forming a ternary alloy of sodium, copper and lead by dispersing sodium metal in oil and reacting the same with a catalytic amount of copper and at least the same amount of lead to provide a slurry of said alloy; contacting the material containing the halogenated hydrocarbon with said slurry using an amount of alloy whereby the sodium is present in excess with respect to halogen present; carrying out said contacting at a temperature of about 250°–300° F. under intense mixing and separately recovering the sodium halide, copper-lead and unreacted sodium-copper-lead alloy from the substantially halogen free material.

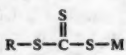
4,601,818

ORE FLOTATION

Clarence R. Bresson, and Kenneth B. Kimble, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

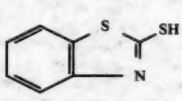
Filed Mar. 30, 1983, Ser. No. 480,205
Int. Cl.[4] B03D *1/14*
U.S. Cl. 209—166 **17 Claims**

1. In a process for the recovery of copper values from an ore containing same, wherein the values are recovered in a froth from an aqueous slurry containing the ore, wherein an aqueous alkaline solution of 2-mercaptobenzothiazole is employed as a mineral collector in the aqueous slurry to increase the copper values in the froth, the improvement comprising employing together with the aqueous alkaline solution of 2-mercaptobenzothiazole an aqueous solution of a hydrocarbyl trithiocarbonate represented by the formula:

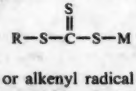


where R represents an alkyl or alkenyl group having from 2 to about 6 carbon atoms and M is selected from the group consisting of sodium and potassium, said 2-mercaptobenzothiazole and hydrocarbyl trithiocarbonate being present at a ratio and in a combined concentration sufficient to result in higher copper values in the froth than would be the case where the 2-mercaptobenzothiazole or the hydrocarbyl trithiocarbonate was used without the other at that concentration.

14. A composition comprising an aqueous alkaline solution of a mercaptobenzothiazole represented by the formula:



and an aqueous solution of a hydrocarbyl trithiocarbonate represented by the formula:

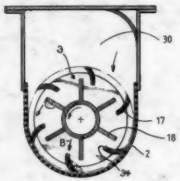


where R is an alkyl or alkenyl radical containing from 2 to about 6 carbon atoms and M is selected from the Group consisting of sodium and potassium and wherein the mercaptobenzothiazole and the hydrocarbyl trithiocarbonate are present at a weight ratio in the range of between about 20:80 and 80:20.

4,601,819
SORTING APPARATUS FOR FIBER STOCK, ESPECIALLY FOR MANUFACTURING PAPER

Maurus Pellhammer, Ravensburg, and Wolfgang Siewert, Ravensburg-Weingartshof, both of Fed. Rep. of Germany, assignors to Escher W GmbH, Ravensburg/Württ, Fed. Rep. of Germany

Filed Jun. 8, 1984, Ser. No. 618,931
Claims priority, application Switzerland, Jun. 14, 1983, 3253/83
Int. Cl.[4] B07B *1/20*; B01D *33/36*; D21C *7/08*
U.S. Cl. 209—273 13 Claims



1. A sorting apparatus for fiber stock, especially for manufacturing paper, comprising:

a screen forming at least part of a substantially circular-cylindrical surface and defining an axis;

a rotor driveable for rotation in a predetermined rotary direction and comprising a rotor shaft which is coaxially located substantially at said axis defined by said screen;

said rotor defining a substantially axial direction, a substantially radial direction and having a substantially central region;

at least one clearing blade;

mounting means containing at least two mounting members arranged at a predetermined mutual distance in said substantially axial direction at said rotor;

said at least one clearing blade being mounted at and extending between said at least two mounting members;

said at least one clearing blade comprising a forwardly positioned clear edge which, during rotation of said rotor, is moved along said screen;

said at least one clearing blade further comprising a run-up surface which is contiguous with said forwardly positioned clearing edge;

said run-up surface extending at an angle relative to said substantially radial direction of said rotor and thereby serving to displace the fiber stock taken up by said at least one clearing blade during rotation of said rotor, in a direction towards said rotor shaft, and said run-up surface terminating at a predetermined distance from said rotor shaft such that said at least one clearing blade leaves an open through-passage in said central region of said rotor;

at least one propelling blade;

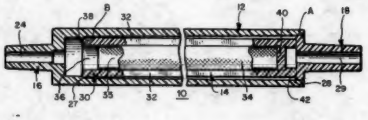
said at least one propelling blade extending between said at least two mounting members and following said at least one clearing blade with respect to said predetermined rotary direction of said rotor; and

said at least one propelling blade extending from said rotor shaft towards said screen and terminating at a predetermined distance therefrom.

4,601,820
LOW-PROFILE INLINE FILTER

Hayden Leason, Humacao, P.R., assignor to Filtertek, Inc., Hebron, Ill.

Filed Mar. 23, 1984, Ser. No. 592,958
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[4] B01D *35/14*
U.S. Cl. 210—94 18 Claims



1. A low-profile inline filter comprising:

a housing unit including means defining an inlet at one end, for allowing fluid to enter the inline filter, a translucent stepped portion, and means defining an opening at the other end;

a filter frame unit including means defining an outlet means at one end, for allowing fluid to exit the inline filter, opaque means at the other end for securing the filter frame unit to the stepped portion of the housing unit by sonic welding, and rib members disposed therebetween for supporting a filter membrane;

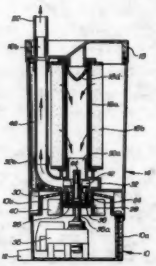
the filter frame unit being fitted substantially within the housing unit; and

means for visually determining when the means for securing is hermetically sealed to the housing unit.

4,601,821
FREESTANDING AQUARIUM FILTER

Robert M. Sherman, Granada Hills, and Charles O. Fuerst, Simi Valley, both of Calif., assignors to Aquaria, Inc., Chatsworth, Calif.

Filed Jun. 10, 1983, Ser. No. 503,360
Int. Cl.[4] E04H *3/16*
U.S. Cl. 210—169 4 Claims



1. A free standing canister-type aquarium filter comprising:

a base section having a motor carried therein, said motor including a vertically extending shaft;

a magnet support element secured to the motor shaft, said support element including a cylindrical vertically facing space which is concentric with the shaft;

a ring-shaped first magnet element carried on the support element, said magnet element containing a plurality of magnetic poles arranged in alternating fashion around the cylindrical space;

an open-topped container configured to rest upon the base section, said container having a generally planar bottom surface which includes a cylindrical extension which fits

into the cylindrical space surrounded by the first magnet element;

a pump section located within the container, said pump section including an impeller shaft and an impeller rotatably attached thereto which is concentric with the motor shaft, said impeller located in a space directly above the extension in the bottom of the container, said pump section further including a second magnet element which is coupled to the impeller shaft and extends into the extension in the bottom of the container wherein the second magnet element includes a plurality of magnetic poles equal to the number of magnetic poles of the first magnet element and wherein the second magnet element is concentric with the first magnet element and is surrounded thereby, whereby rotation of the first magnet element imparts rotation to the second magnet element and thus the impeller;

a filter section located within the container, said filter section being in fluid communication with the pump section, said filter section including a filter element through which water must pass before entering the pump section, and

a cover section having an inlet port coupled to the filter section and an outlet port coupled to the pump section.

4,601,822

WATER PURIFYING APPARATUS

Frank Zamburro, 31 Lenna Street, East Burwood, Victoria, Australia (3151)

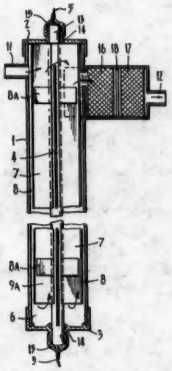
PCT No. PCT/AU83/00022, § 371 Date Oct. 17, 1983, § 102(e) Date Oct. 17, 1983, PCT Pub. No. WO83/02937, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 17, 1982, Ser. No. 557,163

Claims priority, application Australia, Feb. 17, 1982, PF2753

Int. Cl.⁴ C02F *1/32*

U.S. Cl. 210—192 **8 Claims**



1. Apparatus for purifying water, comprising an outer chamber, an inner chamber located within the outer chamber and having at least a substantial portion of the walls thereof formed from a substantially transparent material, an ultra-violet light generating tube located within the inner chamber and means to direct the flow of water through said outer chamber and over said inner chamber, said means to direct the flow of water including a plurality of longitudinal fins extending between said inner and outer chambers, said fins comprising substantially equispaced longitudinal baffles dividing the annulus between the inner and outer chambers into wedge shaped segments with the ultra-violet light generating tube disposed at the apex of each segment and wherein water flow is directed alternately up and down adjacent segments from the inlet to the outlet.

4,601,823

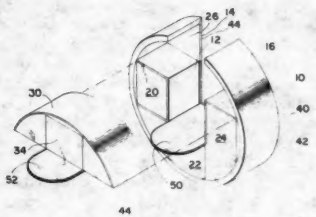
EASILY ATTACHABLE, PIPE MOUNTED MAGNET FOR TREATING LIQUIDS TO PREVENT SCALING DEPOSITS

William D. Beck, 1134 Glenn Ave., Columbus, Ohio 43212

Filed May 15, 1985, Ser. No. 734,155

Int. Cl.⁴ B01D *35/06*; B03C *1/02, 1/30*; C02F *1/48*

U.S. Cl. 210—222 **6 Claims**



1. An improved apparatus for magnetically treating liquid flowing through a pipe to reduce subsequent crystalization of inorganic compounds in the liquid, said apparatus comprising:

(a) a housing having a passage along a longitudinal axis for receipt of the pipe and having a slot extending from the periphery of the housing to the passage to permit the housing to be moved radially onto the pipe;

(b) a plurality of magnets within the housing and contiguously arranged side by side from one side of said slot around the pipe to the other side of the slot, all of said magnets being identically, additively polarized;

(c) a magnet body slidable into the slot and including a magnet which is polarized like and contiguous to the other magnets after being positioned in the slot.

4,601,824

FLAT-MEMBRANE SEPARATING ARRANGEMENT

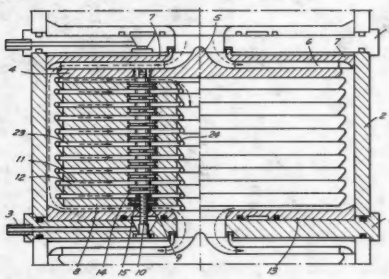
Siegfried Dreyer, Magdeburg, German Democratic Rep., assignor to Veb Chemieanlagenbaukombinat Leipzig-Grimma, Grimma, German Democratic Rep.

Continuation-in-part of Ser. No. 451,543, Dec. 21, 1982, abandoned. This application Jun. 13, 1983, Ser. No. 503,723

Claims priority, application German Democratic Rep., Dec. 24, 1981, 236272

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—232 **9 Claims**



1. A flat-membrane separating arrangement for the separation of pure or colloidal dissolved and partially suspended substances, comprising

a plurality of separating module blocks each having an axis and including a filter container means, a packet of ring-shaped membrane-coated filter discs positioned in said filter container means and spaced from one another in an axial direction so as to form therebetween intermediate

gaps which are peripherally open, means for connecting said filter discs in said packet and including a plurality of spacing rings located between said filter discs to retain the latter in spaced relationship relative to one another, and a plurality of tensioning and permeate-guiding pins connecting said filter discs with one another, means for supplying a raw solution—or concentrate into said filter container means and positioned upstream of said packet of filter discs, means for guiding said raw solution or concentrate in said filter container means and including a plurality of curved guiding blades and a deflecting disc having a central projection and positioned upstream of said packet, said filter container means including an annular wall extending along the length of said packet and being peripherally spaced from said packet so as to form therewith a peripheral annular gap extending over the entire length of said packet and communicating with said intermediate gaps, and at least one circular separating plate positioned upstream of said reflecting disc and having a central opening forming said supplying means; and permeate withdrawing means downstream of said packet and including a radially extending permeate withdrawal opening, each of said module blocks being releasably connectable with a neighboring block so as to assemble a plurality of said blocks into the multi-module arrangement in which the blocks are connected in series, whereby the raw solution or concentrate is admitted into the central opening of a first block in said arrangement, then passes all the blocks of said arrangement one after another and is discharged from a last block in said arrangement, whereas the permeate can be discharged and thus controlled from any module block in said arrangement.

4,601,825

FILTER FOR SEPARATING OFF LIQUIDS OF HIGH VISCOSITY

Hans Eriksson, Kristinehamn, Sweden, assignor to Swed Sorb Corporation AB, Storfors, Sweden

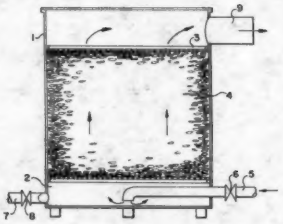
PCT No. PCT/SE84/00064, § 371 Date Nov. 8, 1984, § 102(e) Date Nov. 8, 1984, PCT Pub. No. WO84/03449, PCT Pub. Date Sep. 13, 1984

PCT Filed Feb. 24, 1984, Ser. No. 673,746

Claims priority, application Sweden, Mar. 8, 1983, 8301243

Int. Cl.[4] B01D *29/08*

U.S. Cl. 210—287 **13 Claims**



1. A filter means for separating, by absorption, a high viscosity liquid from a low viscosity liquid, comprising:

a container having liquid in-flow and liquid out-flow means, and having therein a multiplicity of filter cushions, each said cushion comprising a cover of a mesh material having therein at least one filter unit of closed cell foam polymer material in which said closed cells ae perforated, said filter cushions each being capable of absorbing about six times its weight of high viscosity liquid, and the total volume of said cushions being no more than about 20% of the volume of said container.

4,601,826

FILTER FITTED WITH A DEBLINDING DEVICE

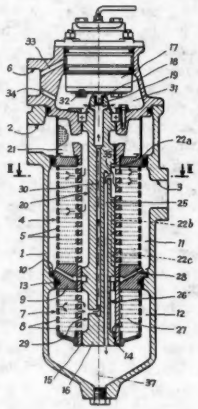
Théophile Christophe, Fontenay Le Fleury, and Jean-Claude Moatti, Boulogne, both of France, assignors to Georges Moatti, France

Filed Jul. 30, 1984, Ser. No. 636,100

Claims priority, application France, Aug. 8, 1983, 83 13043

Int. Cl.[4] B01D *25/32, 29/38*

U.S. Cl. 210—340 **4 Claims**



1. A filter comprising:

a stack of several distinct filter elements each having external and internal radial circumferences assembled together to form an annular sleeve having a cylindrical inner circumference, wherein each of said filter elements includes a plurality of isolated radial segments which stack to form a plurality of isolated columnar filter sections, and wherein each of said filter elements further includes on its external and internal radial circumferences a plurality of communication orifices to provide communication through each of said filter sections between said external and internal circumferences; and

a rotary shut-off valve fitted to rotate coaxially within said sleeve and against said cylindrical inner circumference of said sleeve such that, for given successive angular positions of said valve in said sleeve, said valve opposes corresponding successive, individual filter sections to block said sections against flow therethrough, while flow through the other filter sections is permitted, said valve further having a ported shut-off chamber cut therein to oppose and communicate only with opposing communication orifices in said cylindrical inner circumference of corresponding blocked filter sections when said valve is in said given angular positions, wherein the shape of said ported shut-off chamber and the arrangement of said communiction orifices opposing it are such that, for said given angular positions of said valve in relation to said stack of said filter elements, only one part of said filter elements within said corresponding blocked filter section are in communication with said ported shut-off chamber.

4,601,827
MULTISTAGE ANNEALING OF ARAMIDE REVERSE OSMOSIS MEMBRANES

John J. Buckfelder, Wilmington, Del., and Henry M. Schleinitz, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1984, Ser. No. 655,085
Int. Cl.[4] C08J 9/28; B29C 71/02
U.S. Cl. 210—500.33 11 Claims

1. A process for preparing a reverse osmosis membrane comprising casting a solution comprising 10 to 30 wt. % an aromatic polyamide and 30 to 60 wt. % based on aromatic polyamide of a modifying salt in a polar organic solvent to form a layer from 1 to 10 mils in thickness, evaporating solvent from said layer, quenching said layer with an aqueous medium to gel the aromatic polyamide, and annealing the gelled aromatic polyamide in water in a plurality of stages at from 40° to 110° C. with each successive stage being at a higher temperature than the previous stage, wherein the final stage is above 60° C. and lasts from 5 seconds to twenty minutes.

11. A reverse osmosis membrane made by the process of claim 1.

4,601,828
TRANSFER OF MACROMOLECULES FROM A CHROMATOGRAPHIC SUBSTRATE TO AN IMMOBILIZING MATRIX

Jonathan M. Gershoni, Hamden, Conn., assignor to Yale University, New Haven, Conn.

Continuation of Ser. No. 464,609, Feb. 7, 1983, Pat. No. 4,512,896. This application Jan. 4, 1985, Ser. No. 688,861
The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.
Int. Cl.[4] B01D 15/08
U.S. Cl. 210—635 89 Claims

1. A product comprising a chromatographic substrate having on a surface thereof as an immobilizing matrix a cationic charge modified microporous membrane comprising a hydrophilic membrane having micropores throughout the membrane, the surfaces of the micropores being modified by a cationic charge modifying agent.

4,601,829
PURIFICATION OF LYSINE BY REVERSE-PHASE OSMOSIS

Tetsuya Kaneko, Kawasaki; Masaru Saeki, Fujisawa; Kiyoshi Tanaka, Tokyo, and Tetsuya Kawakita, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,792
Claims priority, application Japan, Dec. 27, 1983, 58-248947
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—638 5 Claims

1. A process of purifying lysine including separating lysine from aqueous ammonia, which comprises:

passing a solution containing lysine over a cation exchange resin such that lysine adsorbs onto said resin,

eluting adsorbed lysine from said resin with an aqueous solution of ammonia, to produce a lysine-containing elution liquid,

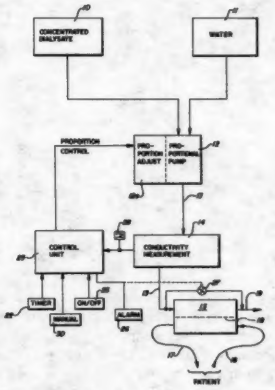
passing said lysine-containing elution liquid directly to a reverse osmosis membrane system, and

concentrating the lysine-containing elution liquid with said reverse osmosis membrane system, wherein said concentrating allows selective removal of ammonia relative to lysine from said lysine-containing elution liquid in the absence of electrolysis, and wherein said concentrating step is conducted under a pressure of 20–60 kg/cm^2 and a temperature of 30°–60° C.

4,601,830
METHOD FOR DIALYSIS

Wei-Tzuoh Chen, Downers Grove, Ill., assignor to The United States of America as represented by the Administrator of Veteran Affairs, Washington, D.C.

Continuation of Ser. No. 95,468, Nov. 19, 1979, abandoned. This application Oct. 28, 1981, Ser. No. 315,668
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—647 6 Claims



5. In the hemodialysis of blood by circulation of a dialysis solution in molecular exchange relation with blood to reduce the osmolality of the blood, the improvement comprising:

mixing a concentrated dialysis solution with water for circulation of the dialysis solution mixture through a dialyzer;

establishing an initial concentration of said dialysis solution mixture having an osmolality of the order of the osmolality of the patient's blood;

reducing the concentration of the dialysis solution mixture as a function of time;

measuring the conductivity of the dialysis solution mixture;

establishing initial upper and lower conductivity limits;

reducing said upper and lower conductivity limits as a function of time;

comparing the dialysis solution mixture conductivity with said upper and lower conductivity limits; and

initiating an alarm if the dialysis solution mixture conductivity is below the lower limit or above the upper limit.

4,601,831
ANTIMICROBIAL ADJUSTMENT TECHNIQUE

Michael M. Cook, Boxford, Mass., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Oct. 3, 1984, Ser. No. 657,116
Int. Cl.[4] B01D 15/00
U.S. Cl. 210—692 9 Claims

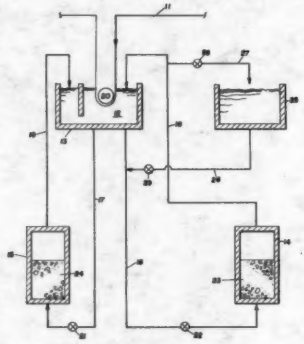
1. A method of adjusting antimicrobial agent concentration of an aqueous media, comprising:

obtaining a first stream of antimicrobial agent containing aqueous media from an antimicrobial treatment vessel;

passing said first stream through and in contact with a bed of solid polyamide absorbant material, said polyamide absorbant material containing a concentration of the same antimicrobial agent that is different from that in said first stream whereby the antimicrobial agent concentration in said stream is adjusted, said antimicrobial agent having a partition coefficient, defined as the ratio of antimicrobial agent absorbed by the polyamide absorbant relative to that retained in the aqueous media at equilibrium, of at least about 10:1 to either increase or decrease the antimicrobial concentration in said stream; and

then returning said adjusted stream to said antimicrobial treatment vessel.

9. A system for adjusting antimicrobial agent concentration of an aqueous medium, comprising:



a vessel for treating a fiber with an aqueous medium containing an antimicrobial agent, having a partition coefficient, defined as the ratio of antimicrobial agent absorbed by the polyamide absorbant relative to that retained in the aqueous media at equilibrium, of at least about 10:1 to either increase or decrease the antimicrobial concentration in said aqueous medium transfer means for passing and returning said medium from said treatment vessel to a second vessel which contains a bed of polyamide absorbant material which contains the same antimicrobial agent as said aqueous medium, and transfer means for passing and returning said medium from said treatment vessel to a third vessel contains a bed of polyamide absorbant material which contains the same antimicrobial agent as said aqueous medium at a concentration less than said second vessel.

4,601,832

METHOD OF PROCESSING WASTE MATERIALS, PARTICULARLY SLUDGE CONTAINING NOXIOUS METALS

Carel W. J. Hooykaas, Rotterdam, Netherlands, assignor to Pelt & Hooykaas B.V., Netherlands

Filed Jan. 11, 1985, Ser. No. 690,747

Claims priority, application Netherlands, Jan. 12, 1984, 8400107; Jun. 5, 1984, 8401797

Int. Cl.[4] C02F *11/14*

U.S. Cl. 210—717 **9 Claims**

1. A process for treating a waste material containing heavy metals including cadmium, using oxysludge including dust having iron and zinc therein, the oxysludge being obtained by collecting the dust from off gases from a blast furnace or steel plant for preparing iron or steel, said process comprising:

(a) treating the oxysludge with a sufficient amount of an acid to produce a solution containing iron ions in the trivalent state;

(b) forming a suspension of the waste material in the solution to thereby dissolve the heavy metals from the waste material to form heavy metal ions in the solution;

(c) mixing a sufficient amount of an alkali with the suspension to precipitate the iron ions as ferric hydroxide, wherein the heavy metal ions are incorporated in the ferric hydroxide and immobilized therein; and

(d) removing the water therefrom to produce a solid composition whereby the heavy metals are immobilized therein and cannot be leached therefrom.

4,601,833

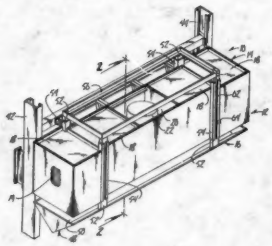
DEVICE FOR REMOVING SEPARATED FLUIDS AND METHOD FOR USING SAME

Wesley M. Shubert, 1614 Pierce Circle, Ames, Iowa 50010

Filed May 22, 1985, Ser. No. 736,952

Int. Cl.[4] B01D *17/00*

U.S. Cl. 210—744 **14 Claims**



1. A method for removing fluid from a reservoir, said reservoir of fluid having an upper surface level, an intermediate level below said upper surface level, and a bottom level below said intermediate level, a crust of partially decayed waste being formed at said upper surface level and a plurality of waste solids being at said bottom level, said method comprising:

holding a frame assembly in an upper position above said fluid, said frame assembly comprising a float frame and a trough frame, said float frame having fluid removal means thereon with an inlet opening for taking in fluid in response to actuation of said fluid removal means, said trough frame having trough means thereon, said float frame being movably mounted relative to said trough frame for movement from a sealed position wherein said trough means is spaced below said inlet opening, said float frame having sufficient buoyancy to float at a predetermined equilibrium position in said fluid with said inlet opening submerged in said fluid to said intermediate level;

moving said frame assembly downwardly from said upper position with said trough frame and said float frame in said sealed position until said float frame is in said equilibrium position;

continuing to move said trough frame downwardly while said float frame remains in said equilibrium position whereby said trough frame will move to said open position relative to said float frame, thereby exposing said inlet opening to fluid from said intermediate level of said reservoir;

actuating said fluid removal means to cause fluid from said intermediate level to be drawn into said inlet opening and removed from said reservoir.

4,601,834

SETTLING OF LIQUID DISPERSIONS

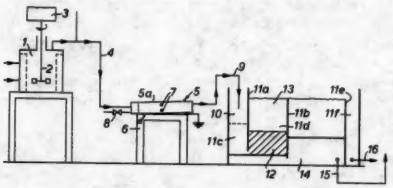
Philip J. Bailes, Baildon, and Samuel K. L. Larkai, Bradford, both of England, assignors to University of Bradford, Bradford, England

Continuation of Ser. No. 316,567, Oct. 30, 1981, abandoned. This application Oct. 4, 1983, Ser. No. 538,940

Claims priority, application United Kingdom, Nov. 1, 1980, 8035196; Aug. 3, 1981, 8123653

Int. Cl.[4] B01D *17/06*

U.S. Cl. 210—748 **9 Claims**



1. A method for aiding the separation of the components of a liquid dispersion, the method comprising passing said dispersion along a flow path, and applying by means of at least one pair of electrodes, a unidirectional electrostatic field which has a field strength below 1100 V/cm and is pulsed at a predetermined frequency up to 60 Hz across at least a portion of the flow path, wherein the electrode of each pair of electrodes to which the high voltage is applied is separated along its entire length from the dispersion by a layer of electrically insulating material.

4,601,835

HYDROXYALKOXY NORBORNYL ETHERS, PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

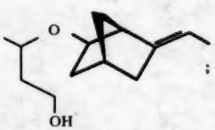
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 646,013, Aug. 31, 1984, which is a continuation-in-part of Ser. No. 574,150, Jan. 26, 1984, Pat. No. 4,521,634, which is a continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, Pat. No. 4,532,364, which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 742,276

Int. Cl.[4] A61K *7/46;* **C11B** *9/00;* **C11D** *3/50*

U.S. Cl. 252—8.9 **5 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of intimately admixing with said consumable material, an aroma augmenting or enhancing quantity of a mixture of compounds having the structures:



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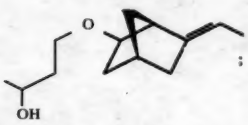

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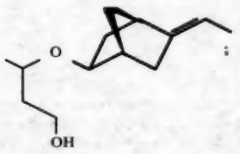

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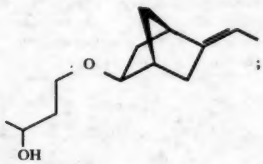

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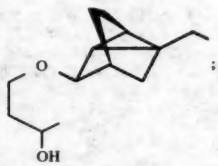

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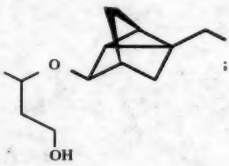

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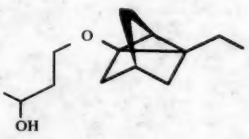

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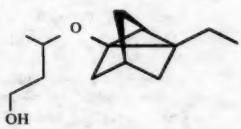
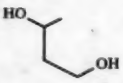


produced according to the process of reacting ethylidene norbornene having the structure:

with 1,3-dihydroxy butane having the structure:



in the presence of a mineral acid catalyst or a Lewis acid catalyst at a temperature in the range of from about 25° C. up to about 120° C., the mole ratio of acid catalyst to ethylidene norbornene varying from about 1:99 up about 1:10; the mole ratio of ethylidene norbornene:1,3-butanediol varying from about 1:1 up to about 1:2 and then recovering said mixture by means of fractional distillation.

4. The process of claim 1 wherein the consumable material is a perfumed article and the perfumed article is a fabric softener composition or a fabric softener article.

4,601,836

PHOSPHATE ESTER/ALCOHOL MICELLAR SOLUTIONS IN WELL ACIDIZING

Loyd W. Jones, Rte. 6, Box 491, Grove, Okla. 74344

Continuation-in-part of Ser. No. 619,689, Jun. 13, 1984, abandoned, which is a continuation of Ser. No. 310,899, Oct. 13, 1981, abandoned. This application Feb. 6, 1985, Ser. No. 698,870

Int. Cl.[4] E21B *43/27*

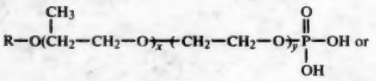
U.S. Cl. 252—8.55 C **29 Claims**

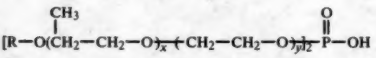
1. An aqueous acid containing oil and gas well treating solution comprising:

(a) an aqueous acid continuous phase;

(b) a C_4 to C_{10} substantially water insoluble aliphatic alcohol; and

(c) an effective amount of a phosphate ester surfactant to render said alcohol soluble in said aqueous acid continuous phase wherein said phosphate ester surfactant is characterized by the formulas:





where R is about a C_8 to C_{18} alkyl group or about a C_8 to C_9 alkyl substituted phenyl group, x is from about 2 to 6 and y is from about 12 to 22 and wherein the 2 to 6 units of propylene oxide are substantially a block polymer attached to the R—O group and wherein the 12 to 22 units of ethylene oxide are substantially a block polymer, wherein at least 75 parts by volume of said aqueous acid continuous phase containing up to 28 wt.% acid is combined with up to 25 parts by volume of a mixture of said alcohol and said phosphate ester surfactant wherein said mixture comprises up to about 8 parts by volume surfactant.

4,601,837

PROCESS FOR THE PREPARATION OF OVERBASED, MOLYBDENUM-ALKALINE EARTH METAL SULFONATE DISPERSIONS

Joseph J. Valcho; Steven E. Lindberg; Mack W. Hunt, all of Naperville, Ill., and Albert R. Sabol, Munster, Ind., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 6, 1985, Ser. No. 773,173

Int. Cl.[4] C10M *135/10, 155/00*

U.S. Cl. 252—40.7 **34 Claims**

1. A process for the manufacture of an overbased molybdenum-alkaline earth metal sulfonate, which process comprises: (a) introducing into a reaction zone a sulfonic acid, at least about 0.1 wt% of which is neutralized with ammonia; (b) adding a substantially inert diluent, an alkaline earth metal compound, an alkanol having from one to seven carbon atoms, and water to said reaction zone to form a hydration mixture; (c) heating said hydration mixture to an elevated temperature to hydrate said alkaline earth metal compound to produce an alkaline earth metal hydroxide hydrate; (d) adding an acidic material to said reaction zone at a temperature within the range of about 26.7° C. (80° F.) to about 68.5° C. (155° F.); and (e) adding a molybdenum-containing compound to said reaction zone at a time in said process that is subsequent to said introducing of a sulfonic acid and prior to said adding of an acidic material to form said molybdenum-alkaline earth metal sulfonate.

4,601,838

WATER-SOLUBLE CHLORINATED FATTY ESTER ADDITIVES

Karl P. Kammann, Jr., Crown Point, Ind., and Terrence L. Wagner, Crete, Ill., assignors to Ferro Corporation, Cleveland, Ohio

Filed Nov. 19, 1985, Ser. No. 799,667

Int. Cl.[4] C11C *3/00*; C10M *173/00*

U.S. Cl. 252—49.3 **10 Claims**

1. An additive composition, comprising one or more water-soluble polyoxyalkyl esters of chlorinated aliphatic carboxylic acids, wherein:

(a) the aliphatic carboxylic acids contain from about 8 to about 36 carbon atoms; and

(b) the chlorine content of the chlorinated aliphatic carboxylic acids component is within the range from about 10 to about 50 wt. %.

9. Water-based metalworking fluid concentrate comprising from about 5 to about 15 wt. % nonionic water-soluble polyoxyalkyl esters of chlorinated aliphatic carboxylic acids.

4,601,839

STABILIZED POLYMERS, NOVEL STABILIZERS, AND SYNTHESIS THEREOF

John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

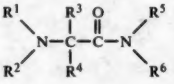
Continuation-in-part of Ser. No. 916,639, Jun. 19, 1978, Pat. No. 4,310,429. This application Nov. 13, 1981, Ser. No. 320,991

The portion of the term of this patent subsequent to Jan. 12, 1999, has been disclaimed.

Int. Cl.[4] C10M *1/32, 1/24*

U.S. Cl. 252—51.5 A **16 Claims**

5. A catalytic method for directly preparing a substituted alpha-aminoacetamide having the formula



wherein,

at least one of R^1, R^2, R^5 and R^6 substituents is alkyleneimine having from 5 to 8 carbon atoms in which hydrogen atoms

may be substituted with alkyl groups having from 1 to about 24 carbon atoms, and, when one substituent on either N atom is alkyleneimine, the other substituent on that N atom represents hydrogen or said alkyl; and,

R^3 and R^4 independently represent the following substituents: hydrogen; aryl, alkyl having from 1 to about 24 carbon atoms wherein functional groups may be substituted with alkyl groups; hydroxyalkyl having from 1 to about 12 carbon atoms; haloalkyl having from 1 to about 12 carbon atoms; cyanoalkyl having from 2 to about 12 carbon atoms; aminoalkyl or iminoalkyl having from 1 to about 12 carbon atoms; ether groups having from 3 to about 18 carbon atoms; hydroxyalkyl ether or cyanoalkyl ether groups having from 4 to about 18 carbon atoms; alkenyl and aralkyl having from 7 to about 14 carbon atoms; alkylene having from 1 to about 7 carbon atoms; alkylene having from 2 to about 10 carbon atoms; each substituent optionally containing a phosphite, ester or hindered phenol group, and each substituent in combination, R^3 with R^4, may form a ring containing from about 5 to about 9 ring atoms, which ring may also contain hetero atoms such as N, S or O, and optionally contain a keto, ester, amide, ether or thio group; comprising,

reacting (a) an alkyleneimine amine nucleophilic agent with (b) a carbonyl compound and (c) a trichloromethide generating agent, in an aqueous alkaline medium, at a relatively low temperature in th range from −20° C. to about 50° C., in the presence of a catalytic amount of an onium salt sufficient to yield said substituted alpha-aminoacetamide.

4,601,840

MIST LUBRICATION PROCESS

Eugene R. Zehler, Cincinnati, and Clark J. Flake, Trenton, both of Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,462
Int. Cl.[4] C10M *107/20, 107/32*
U.S. Cl. 252—56 S **14 Claims**

1. In a lubrication process wherein a mist of a lubricant is generated in air at a pressure of about 10 to 100 psig, pneumatically transported to a metal surface to be lubricated, coalesced into larger droplets, and deposited on said metal surface to provide a lubricating film thereon, to achieve high throughput with good mist distribution and to obtain good lubrication properties, the improvement which comprises utilizing a lubricant composition comprising:

(1) 45 to 95 parts by weight of a synthetic ester having a viscosity of 15 to 300 centistokes at 40° C. and selected from the group consisting of

(a) polyol esters derived from an aliphatic polyol having from 2 to 8 hydroxyl groups and 3 to 12 carbon atoms and an aliphatic monocarboxylic acid or mixture of aliphatic monocarboxylic acids having from 5 to 20 carbon atoms;

(b) trimellitate esters derived from trimellitic acid or trimellitic anhydride and an aliphatic alcohol having from 8 to 16 carbon atoms; and

(c) polymeric fatty acid esters derived from a polymeric fatty acid containing 75% or more C_{36} dimer acid and a C_{1-13} mono-functional alcohol;

(2) 8 to 40 parts by weight, on a 100% polymer basis, polyisobutylene having an average molecular weight from 4,000 to 10,000; and

(3) 0.1 to 1 part by weight, on a 100% polymer basis, polyisobutylene having an average molecular weight from 25,000 to 300,000; and

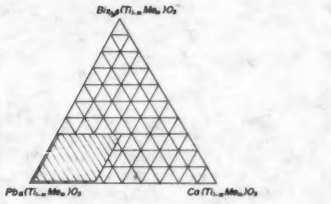
said composition having a viscosity of 125 to 750 centistokes at 40° C.

4,601,841

FERROELECTRIC CERAMIC COMPOSITION

Goichi Yasuda, Tokyo; Rika Noguchi, Abiko, and Yoichi Tanaka, Funabashi, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,134
Claims priority, application Japan, Mar. 12, 1984, 59-46843
Int. Cl.[4] C04B *35/46*
U.S. Cl. 252—62.9 **1 Claim**



1. A ferroelectric ceramic body consisting essentially of lead titanate, bismuth titanate and calcium titanate as the basic components and having a chemical composition represented by the formula

$$(1-x-y)Pb_\alpha TiO_3.xBi\tfrac{1}{\beta}TiO_3.yCaTiO_3,$$

in which x is a positive number in the range from 0.005 to 0.30, y is a positive number in the range from 0.01 to 0.35, β is a positive number in the range from 0.95 to 1.02 and β is a positive number in the range from 0.95 to 1.05, the atoms of titanium being replaced with manganese atoms, niobium atoms or a combination thereof in such amounts that the total of manganese atoms and niobium atoms is up to 10 atomic percent, and the range of the amounts of each of the manganese atoms and niobium atoms is from 0.5 to 5 atomic percent.

4,601,842

PREVENTION OF FREEZING AT MODERATE SUPERCOOLING USING BIOGENIC ICE NUCLEATION INHIBITORS

Gerald Caple, and Richard G. Layton, both of Flagstaff, Ariz., assignors to University Patents, Inc., Westport, Conn.

Continuation of Ser. No. 517,938, Aug. 1, 1983, abandoned, which is a continuation of Ser. No. 282,996, Jul. 14, 1981, abandoned. This application Apr. 25, 1984, Ser. No. 603,540
Int. Cl.[4] A01G *1/00*
U.S. Cl. 252—70 **4 Claims**

1. A method for inhibiting the ice-nucleating activity of ice-nucleating bacteria which comprises contacting said ice-nucleating bacteria with a biogenic ice-nucleation inhibitor comprising a solution of a water-soluble denaturable proteinaceous material derived as an aqueous extract of a source plant component which survives the freezing stress to which said source plant is normally subjected in its natural habitat, wherein said source plant is a species belonging to a family selected from the group consisting of Rosaceae, Buxaceae, Linaceae, Leguminosae, Labiatae, Umbelliferae, Compositae, Gramineae, and Iridaceae.

4,601,843

PHOSPHAZENE BASED FUNCTIONAL FLUID COMPOSITIONS

Lawrence J. Carr, Elk Grove Village; George M. Nichols, Evanston, and Selwyn H. Rose, Highland Park, all of Ill., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Apr. 2, 1985, Ser. No. 719,392

Int. Cl.[4] C10M *105/16, 105/70, 105/74*

U.S. Cl. 252—78.5 **18 Claims**

1. A functional fluid composition comprising a plurality of different cyclic phosphazene compounds of the general formula:

$$(P{=}N)_n(R)_a(R')_b(R'')_c(R''')_d$$

wherein;

R is at least one alkoxy moiety described by the general formula $-OCH_2(CF_2)_yX$, with X being hydrogen or fluorine and y being equal to 1 to about 10;

R', R'' and R''' are different aryloxy moieties, each of R', R'' and R''' being selected from the group consisting of phenoxy, alkoxy phenoxys, alkylphenoxys, chlorinated phenoxys, fluorinated phenoxys, arylphenoxys, phenoxy phenoxys, fluoroalkyl phenoxys, fluoroalkoxy phenoxys, chlorinated phenoxy phenoxys, fluorinated phenoxys phenoxys and mixtures thereof;

n is equal to 3 to about 4;

for each of said phosphazene compounds, each of a, b, c, and d is equal to or greater than zero such that the sum a+b+c+d is equal to 2n; and

for the composition as a whole, the average value of each of a, b, c, and d is greater than 0; and

wherein each of said different phosphazene compounds is present in an amount less than 70% by weight of the total phosphazene content of said composition.

4,601,844

GRANULAR AUTOMATIC DISHWASHER DETERGENT WITH ALKYL PHOSPHATE AND CALCIUM ION SOURCE

William A. Cilley, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 646,611, Aug. 31, 1984, abandoned. This application Sep. 24, 1985, Ser. No. 779,310

Int. Cl.[4] B01D *19/04;* **C11D** *1/34, 1/825, 3/02*

U.S. Cl. 252—95 **15 Claims**

1. A low sudsing granular detergent composition suitable for use in an automatic dishwashing machine comprising on an anhydrous basis:

(a) from about 20% to about 95% by weight of a detergency builder material or mixtures thereof;

(b) a chlorine bleach ingredient to provide from about 0.5% to about 5% of available chlorine based on the weight of the detergent composition;

(c) from about 1% to about 15% of a low-foaming nonionic surfactant which is solid at 35° C. (95° F.)

(d) from about 5% to about 50%, based on the weight of the ethoxylated nonionic surfactant of an alkyl phosphate ester or mixtures thereof;

(e) from about 0.25 moles to about 2.5 moles of a water soluble or water solubilizable calcium containing material per mole of alkyl phosphate ester present.

7. A low sudsing granular detergent composition suitable for use in an automatic dishwashing machine comprising:

(a) from about 40% to about 90% by weight of a detergency builder material, or mixtures thereof;

(b) an organic chlorine bleach component to provide from about 1% to about 3% of available chlorine based on the weight of the detergent composition;

(c) from about 2% to about 8% of an ethoxylated surfactant derived from the reaction of a monohydroxy alcohol or alkylphenol containing from about 8 to about 20 carbon atoms, exclusive of cyclic carbon atoms with from about 6 to about 15 moles of ethylene oxide per mole of alcohol or alkylphenol on an average basis.

(d) from about 5% to about 20% based on the weight of the ethoxylated nonionic surfactant of an alkyl phosphate ester selected from the group comprising mono C_{18} alkyl acid phosphate, a mixture of mono C_{18} alkyl acid phosphate and di-C_{18} alkyl acid phosphate, and hydrates thereof and mixtures thereof;

(e) from about 0.5 moles to about 1.5 moles of water-soluble calcium salt per mole of alkyl phosphate ester present.

4,601,845

BLEACHING COMPOSITIONS CONTAINING MIXED METAL CATIONS ADSORBED ONTO ALUMINOSILICATE SUPPORT MATERIALS

James S. Namnath, Demarest, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 2, 1985, Ser. No. 719,095

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.[4] C11D *3/06, 3/39;* **D06L** *3/02*

U.S. Cl. 252—99 **21 Claims**

1. A bleaching composition comprising:

(a) a peroxy compound; and

(b) a bleach catalyst comprising an aluminosilicate support material whereon is adsorbed a water-soluble manganese (II) salt and a salt of a divalent metal cation selected from magnesium or zinc;

the weight ratio of manganese (II) to divalent metal cation being from about 1:20 to 20:1, the ratio of divalent metal cation to aluminosilicate support material ranging from about 1:1000 to 1:10, and the weight ratio of catalyst to peroxy compound being from about 1:100 to 1:1.

6. A bleaching composition according to claim **1** further comprising an inorganic phosphate salt stabilizer in an amount from about 5 to 35% by weight of the total composition.

4,601,846

LIQUID CRYSTAL SUBSTANCES FOR THE GUEST-HOST EFFECT

Dietrich Demus; Horst Zaschke, both of Halle; Gerhard Pelzl, Halle-Neustadt; Hartmut Enzenberg, Halle, and Andreas Isenberg, Eisleben, all of German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik im VED Kombinat Mikroelektronik, Berlin, Fed. Rep. of Germany

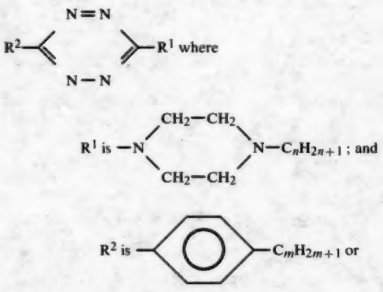
Filed Apr. 13, 1984, Ser. No. 599,864

Claims priority, application German Democratic Rep., Apr. 29, 1983, 250330

Int. Cl.[4] C09K *3/34;* **G02F** *1/13;* **C07D** *257/08, 257/12*

U.S. Cl. 252—299.1 **21 Claims**

1. Liquid crystal compounds for the guest-host effect which are derivatives of tetrazine of the general formula:



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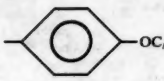


and m and n are 1 to 10.

4,601,847

COMPOSITION FOR USE IN ELECTROPLATING OF METALS

Loren L. Barber, Jr., Lake Elmo, Minn., assignor to MacDermid, Incorporated, Waterbury, Conn.

Division of Ser. No. 525,578, Aug. 22, 1983, Pat. No. 4,502,926. This application Oct. 19, 1984, Ser. No. 662,776

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—312 **21 Claims**

1. A composition for use as an additive to electroplating baths, comprising a stable microemulsion consisting essentially of water, a functional electroplating agent and a surfactant component, the concentration of said electroplating agent in said microemulsion being at least about 1% by weight based on the total weight of components of the microemulsion, said functional chemical electroplating agent being one which is substantially water-insoluble at the concentrations and conditions prevailing in said microemulsion and at the concentrations and conditions existing in said electroplating bath.

4,601,848

RESISTOR COMPOSITIONS FOR PRODUCING A RESISTOR IN RESISTOR-INCORPORATED SPARK PLUGS

Masao Sakai, Kasugai; Makoto Sugimoto, Nagoya; Miyakazu Hashizume, Nagoya; Yutaka Tanaka, Nagoya, and Yukihiko Ito, Seto, all of Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Filed Jan. 11, 1985, Ser. No. 690,628

Claims priority, application Japan, Jan. 18, 1984, 59-7853; Jan. 18, 1984, 59-7854

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—503 **5 Claims**

1. A resistor composition for producing a resistor in resistor-incorporated spark plugs, which composition comprises (a) 100 parts by weight of a base mixture composed of 30 to 70% by weight of a glass and the balance being an inorganic aggregate; said inorganic aggregate being selected from the group consisting of alumina, zircon, mullite, silica, fused silica, magnesia, clay, silicon nitride, aluminium nitride and boron nitride, or a mixture of two or more thereof, (b) 0 to 30 parts by weight of a stabilizing agent for the resistance under load, said stabilizing agent for the resistance under load being selected from the group consisting of one or more of the oxides and carbides of rare earth elements and metals of Sub-groups: IVa group, Va group and VIa group of the Periodic Table, ZnO, B_4C, SiC, TiB and TiN, (c) 0.1 to 10 parts by weight of a regulating agent for the resistance value; said regulating agent being selected from the group consisting of carbon black, an organic carbonaceous substance and a mixture of carbon black with an organic carbonaceous substance, and (d) 0.01 to 10 parts by weight of a metallic powder being selected from the group consisting of one or more of the metals of Al, Mg, Zn, Sn, Ti, Zr, Fe, Ga and Ag and alloys of said metals.

4,601,849

ELECTRICALLY CONDUCTIVE ORGANIC POLYMERIC MATERIAL AND PROCESS FOR PRODUCTION THEREOF

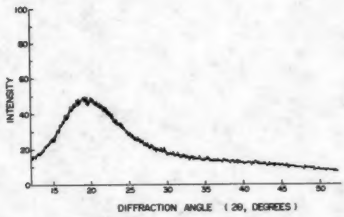
Shizukuni Yata, Hyogo, Japan, assignor to Kanebo, Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,816

Claims priority, application Japan, Jun. 15, 1981, 56-92626; Feb. 5, 1982, 57-16358

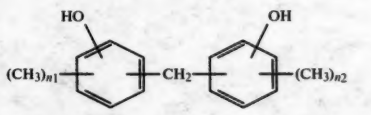
Int. Cl.[4] H01B *1/00*

U.S. Cl. 252—500 **23 Claims**



1. An electrically conductive organic polymeric material comprising (a) an infusible, insoluble substrate having a polyacene skeletal structure and having a hydrogen/carbon atomic ratio in the range of 0.60 to 0.15, said substrate having been prepared by heating an aromatic condensation polymer consisting of carbon, hydrogen and oxygen to a temperature in the range of 400° C. to 800° C. in a non-oxidizing atmosphere, said aromatic condensation polymer being selected from the group consisting of (1) condensation products of aromatic hydrocarbon compounds having a phenolic hydroxyl group with aldehydes, (2) condensation products of a mixture of aromatic hydrocarbon compounds having a phenolic hydroxyl group and aromatic hydrocarbon compounds free of phenolic hydroxyl groups with aldehydes, and (3) furan resins; and (b) an effective amount of a doping agent selected from the group consisting of electron donating doping agents, electron accepting doping agents, and mixtures thereof, said doping agent being absorbed into said substrate and being effective to increase the electrical conductivity of said substrate.

23. A material as claimed in claim 1, in which said aromatic hydrocarbon compound having a phenolic hydroxyl group is selected from the group consisting of phenol, cresol, xylenol,

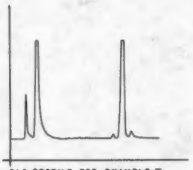


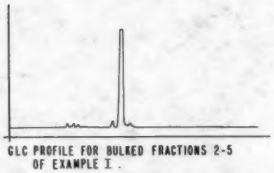
wherein n is an integer of 0 to 2, hydroxy biphenyls and hydroxy naphthalenes, said aldehyde is selected from the group consisting of formaldehyde, acetaldehyde and furfural, and said aromatic hydrocarbon compound free of phenolic hydroxyl groups is selected from the group consisting of xylene and toluene.

4,601,850
1-HYDROXYMETHYL-2-ISOPROPENYL-1,5-DIMETHYLCYCLOPENTANE, N-PROPYL ESTER THEREOF AND ORGANOLEPTIC USES THEREOF

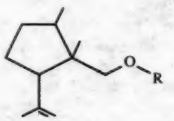
Richard M. Boden, Ocean, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 685,071
Int. Cl.[4] A61K *7/46;* C11B *9/00*
U.S. Cl. 252—522 R 7 Claims





1. The compound having the structure:



wherein R represents hydrogen or n-propyl.

4,601,851
CYCLODODEC-2-ENYL ETHERS IN FRAGRANCE COMPOSITIONS

Martin Bartmann, Recklinghausen, and Klaus Burzin, Marl, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,005
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300341
Int. Cl.[4] A61K *7/46;* C07F *43/184*
U.S. Cl. 252—522 R 12 Claims

1. In a fragrance composition consisting essentially of a plurality of fragrance components, the improvement wherein at least one such fragrance component is a straight or branched chain C_{1-4} alkyl or C_{2-4} alkenyl ether of cyclododec-2-en-1-ol, in an amount sufficient to impart to said composition an intensive, long-lasting, spicy and slightly aldehydic note similar to that imparted by natural patchouli oil.

4,601,852
PROCESS FOR THE PREPARATION OF HUMAN OR THE DERIVATIVES THEREOF FROM PIG INSULIN OR THE DERIVATIVES THEREOF

Rainer Obermeier, Hattersheim am Main; Jürgen Ludwig, Brachttal, and Gerhard Seipke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 339,731, Jan. 15, 1982, abandoned. This application Aug. 15, 1984, Ser. No. 641,357
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101382
Int. Cl.[4] C07K *7/40*
U.S. Cl. 530—303 16 Claims

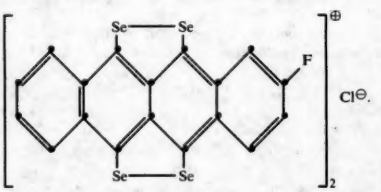
1. A method for making a product which is human insulin having free functional groups or having one or more protected functional groups, which method comprises reacting a pig insulin reagent which is pig insulin having free functional groups or having one or more protected functional groups, in water at a temperature not exceeding 40° C. and at a pH between pH 4 and the isoelectric point of said pig insulin reagent, the pH value being adjusted by the addition of a weak organic acid, and in the presence of a trypsin or of a trypsin-like enzyme, the weight ratio of insulin to enzyme being in the range from 1:1 to 100:1, with L-threonine-di-tert.-butyl ester acetate, which is used in an about 10-fold to 100-fold molar excess with respect to insulin, and then removing said tert.-butyl group from the product so obtained.

4,601,853
(2-FLUORO-5,6,11,12-TETRASELENOTETRACENE)$_2$ CHLORIDE

Bruno Hilti, Basel, and Carl W. Mayer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 4, 1985, Ser. No. 697,995
Claims priority, application Switzerland, Feb. 13, 1984, 678/84
Int. Cl.[4] C07D *517/06;* H01B *1/00;* B32B *9/04*
U.S. Cl. 260—239 R 1 Claim

1. The complex of the formula I



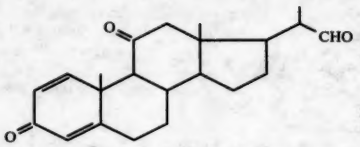
4,601,854
PROCESS FOR THE PRODUCTION OF PREDNISONE 17.21-DIACYLATES

Jean Buendia, Le Perreux sur Marne, and Michel Vivat, Lagny-sur-Marne, both of France, assignors to Roussel Uclaf, Paris, France

Filed Jan. 28, 1985, Ser. No. 695,485
Claims priority, application France, Feb. 3, 1984, 84 01684
Int. Cl.[4] C07J *21/00*
U.S. Cl. 260—239.5 10 Claims

7. A compound having a formula selected from the group consisting of

III



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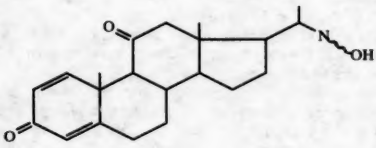
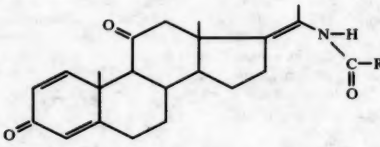
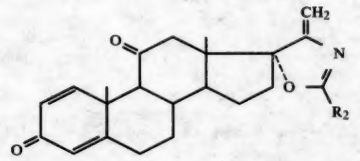


VI



and

VII



wherein R_2 is a hydrocarbon of 1 to 8 carbon atoms.

4,601,855

METHOD OF PREPARING 9β, 10α-5,7-DIENE STEROIDS

Menso P. Rappoldt, and Gerardus H. M. Mos, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Filed Feb. 12, 1985, Ser. No. 701,018

Claims priority, application Netherlands, Feb. 15, 1984, 8400482

Int. Cl.⁴ C07J *21/00, 9/00*

U.S. Cl. 260—239.55 C **6 Claims**

1. A method of preparing 9β,10α-5,7-diene steroids by irradiating the corresponding 9α,10β-steroids with filtered ultraviolet light, characterized in that the irradiation is carried out with an antimony lamp.

4,601,856

METHOD OF PURIFYING OLEIC ACID

Masao Suzuki, Nishinomiya; Kenichi Hashimoto, Kobe, and Tadashi Satoh, Nishinomiya, all of Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,219

Claims priority, application Japan, Jun. 12, 1984, 59-119170

Int. Cl.⁴ C11C *1/08*

U.S. Cl. 260—419 **14 Claims**

1. A method of producing oleic acid, comprising the steps of:
(a) dissolving an oleic acid containing fatty acid mixture and urea in an organic solvent and then cooling them to separate and remove the resulting precipitated crystal therefrom;
(b) partially saponifying the fatty acid mixture contained in the organic solvent solution to separate a crystal by crystallization; and
(c) subjecting the resulting crystal to an acid decomposition.

4,601,857

PROCESS FOR FAT FRACTIONATION WITH AZEOTROPIC SOLVENTS

Francis E. Luddy, Hatboro, Pa., and Sergio Longhi, Parma, Italy, assignors to Nestec S. A., Vevey, Switzerland

Filed Jul. 26, 1983, Ser. No. 517,508

Int. Cl.⁴ C09F *5/10;* C11B *3/00*

U.S. Cl. 260—428.5 **7 Claims**

1. A process for the solvent fractionation of fats comprising:
(a) dissolving the fat in a binary azeotropic solvent mixture wherein the volume of solvent is from 1.5 to 8.0 ml per gram of fat;
(b) cooling the solution from step (a) to 10°–15° C. to form a precipitate;
(c) separating the precipitate and solvent phase of step (b);
(d) washing the precipitate from step (c) with fresh solvent mixture which has been cooled to about 2° C. below the solvent temperature utilized in step (b) using a volume of at least about 8% of the volume of solvent utilized in step (b);
(e) separating the washed precipitate and solvent phase of step (d) to provide a solid fat fraction having a melting point above 40° C.; and
(f) combining the solvent phases from steps (c) and (e) and eliminating solvent therefrom to provide a liquid oil fraction.

4,601,858

METHOD FOR PREPARING BISCHLOROFORMATE COMPOSITIONS

Thomas G. Shannon, Schenectady, and Daniel J. Brunelle, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 13, 1985, Ser. No. 744,348

Int. Cl.⁴ C07C *69/96, 68/02*

U.S. Cl. 558—281 **11 Claims**

1. A method for preparing a composition comprising water-insoluble bischloroformates of organic dihydroxy compounds which comprises passing gaseous phosgene into an agitated solution consisting essentially of water and at least one di-(alkali metal) salt of said organic dihydroxy compound while maintaining said solution at a temperature within the range of about 0°–50° C., and continuing passage of said phosgene and agitation until said bischloroformate composition has precipitated.

4,601,859

SELECTIVE HYDROGENATION OF ALIPHATIC DINITRILES TO OMEGA-AMINONITRILES IN AMMONIA WITH SUPPORTED, FINELY DISPERSED RHODIUM-CONTAINING CATALYST

James E. Galle, Madison; Frank Mares, Whippany; Steven E. Diamond, Springfield; Jeffrey Corsi, Andover, all of N.J., and Francis J. Regina, Brooklyn, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 4, 1984, Ser. No. 607,037

Int. Cl.⁴ C07C *121/43*

U.S. Cl. 558—459 **25 Claims**

1. A process for producing an omega-aminonitrile which comprises reacting at a reaction temperature of between about 20° and about 200° C. a dinitrile of the formula NC—$(CH_2)_n$—CN with n being an integer from 1 to 10 with hydrogen at a partial pressure of at least about one atmosphere in the presence of:
(a) ammonia in a molar amount at least equal to the molar amount of dinitrile present, and
(b) a rhodium-containing catalyst prepared by hydrolyzing a rhodium (III) halide or nitrate on a basic support selected

from the group consisting of basic alumina, thoria, alkaline earth metal oxides and alkaline earth metal carbonates with strong aqueous base at a first temperature between about 50° C. and about 100° C. to produce a supported rhodium (III) hydroxide, drying the supported rhodium hydroxide at subatmospheric pressure and a second temperature between about 50° C. and about 250° C., and intimately contacting with agitation the dried rhodium hydroxide with hydrogen at a third temperature between about 260° and about 360° C. for a period of time necessary to reduce the rhodium (III) hydroxide to rhodium and to preserve an ultra-disperson of the rhodium characterized in that two-dimensional rafts are present; and recovering the omega-aminonitrile of the formula $NC-(CH_2)_n-CH_2-NH_2$, as the major product.

4,601,860

METHOD FOR PRODUCING SELENOETHERS FROM SELENOALCOHOLS OR THEIR SALTS, AND CARBONATES

James A. Krogh, Mount Prospect, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 23, 1982, Ser. No. 422,243
Int. Cl.[4] C07C *163/00*
U.S. Cl. 260—550 **19 Claims**

1. A method comprising reacting organic selenol or salt thereof with organic carbonate represented by the formula

$$R_1OCOR_2$$
$$\|$$
$$O$$

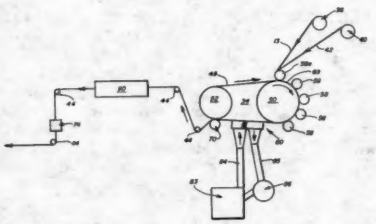
to produce organic selenoether, wherein R_1 and R_2 are each independently monovalent organic grups which may be the same or different, and wherein the alpha carbon of at least one R_1 and R_2 is substantially sterically unhindered.

4,601,861

METHODS AND APPARATUS FOR EMBOSSING A PRECISION OPTICAL PATTERN IN A RESINOUS SHEET OR LAMINATE

Robert M. Pricone, Vernon Hills, and William N. Roberts, Niles, both of Ill., assignors to Amerace Corporation, Hackettstown, N.J.

Continuation-in-part of Ser. No. 430,860, Sep. 30, 1982, Pat. No. 4,486,363. This application Aug. 10, 1984, Ser. No. 640,011
The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.6 **23 Claims**



1. An improved method for continuously embossing a precision optical pattern requiring sharp angles and flatness of faces in certain detail on one surface of a continuous resinous sheeting material, the method being performed with the aid of a generally cylindrical endless metal embossing element having an inner surface and an outer surface, the outer surface having a precision optical embossing pattern which is the reverse of the precision optical pattern to be formed on one surface of said sheeting, and wherein the method includes the steps of:

(a) continuously moving the endless embossing element along a closed course through a heating station, where said embossing element is heated through its inner surface to a predetermined temperature and then to a cooling station where said embossing element is cooled below said predetermined temperature;

(b) continuously feeding onto said embossing element as it passes through a part of said heating station superimposed resinous film and sheeting materials, said resinous materials of said film and said sheeting each having different glass transition temperatures, said sheeting being in direct contact with the outer precision patterned surface of said embossing tool;

(c) continuously heating said embossing element to said predetermined temperature at said heating station, said temperature being greater than the glass transition temperature of said sheeting and less than the glass transition temperature of said resinous film;

(d) pressing said superimposed film and sheeting against said embossing element at a plurality of pressure points sequentially spaced along said heating station with one surface of said sheeting confronting and engaging said precision optical pattern on said embossing element until said one surface of said sheeting conforms to said precision optical embossing pattern;

(e) continuously passing said embossing element and said superimposed film and sheeting through said cooling station where the temperature of said embossing element and said sheeting is lowered below said sheeting glass transition temperature, with said film serving to substantially continuously maintain said sheeting in engagement with said embossing element through the heating station and through said cooling station; and

(f) continuously stripping said superimposed layer of film and embossed sheeting from said embossing element, said film being later strippable from the other face of said sheeting without destroying said optical pattern formed on said one face of said sheeting, the improvement comprising:

(g) said cooling step being substantially effected while said superimposed film and sheeting and embossing tool are disposed in a generally planar condition, thereby to achieve an increase in the optical efficiency of the embossed sheeting.

17. Apparatus for continuously embossing a precision optical pattern on one surface of transparent resinous material or materials, said apparatus comprising:

embossing means including a continuous seamless embossing tool in the form of a thin metal element having an inner surface and an outer surface, said outer surface having a precision optical embossing pattern thereon which is the reverse of the precision optical pattern to be formed in the resinous material;

means for continuously moving said embossing element along a closed course;

means for introducing superimposed film and sheeting of resinous materials onto said embossing element with one face of said sheeting in direct contact with said optical pattern on said embossing element;

heating means for raising the temperature of said embossing pattern to be above the glass transition temperature of said sheeting and below the glass transition temperature of said film while said embossing element is in a first portion of its course;

cooling means for lowering the temperature of said sheeting to be below said glass transition temperature while said element and said sheeting are in a generally planar condition in their course, thereby to rigidify said precision pattern while in an undistorted condition;

a plurality of pressure means sequentially spaced along said first portion of said course for pressing said superimposed film and sheeting against said embossing element with said

one surface of said sheeting confronting and engaging said embossing pattern until said one surface conforms to said embossing pattern, with said film serving to substantially continuously maintain said sheeting in engagement with said embossing element until the latter passes said second portion of said course; and

means for thereafter stripping said superimposed film and sheeting from said embossing element.

4,601,862

DELAYED QUICK CURE ROCKET MOTOR LINER

James D. Byrd, and Robert T. Davis, both of Huntsville, Ala., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 579,221, Feb. 10, 1984. This application Jul. 1, 1985, Ser. No. 750,209

Int. Cl.[4] C06B *21/00*

U.S. Cl. 264—3.1 **6 Claims**

1. In the process of applying a rocket motor liner to an inside surface of a rocket motor casing by coating said casing with a rocket motor liner composition and then curing said liner composition; wherein the improvement comprises using a rocket motor liner composition comprising the product of a hydroxyl terminated polybutadiene prepolymer; a diisocyanate curing agent for forming urethane linkages with said prepolymer; a trifunctional aziridine bond promoter; a filler; and a curing catalyst consisting essentially of a carboxylic acid anhydride and triphenyl bismuth and not including magnesium oxide.

4,601,863

PROCESS FOR PRODUCING POWDER OF MICROCAPSULES

Shunsuke Shioi; Gensuke Matoba, both of Osaka, and Makoto Miyake, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1985, Ser. No. 695,646

Claims priority, application Japan, Feb. 9, 1984, 59-23698; May 11, 1984, 59-94825

Int. Cl.[4] B01J *13/02*

U.S. Cl. 264—4.3 **26 Claims**

1. A process for producing a substantially agglomerate-free powder of microcapsules, comprising

preparing a first dispersion of microcapsules in a dispersing medium, said dispersing medium comprising a liquid medium selected from the group consisting of water and hydrophilic substance and an emulsifier comprising a water-soluble high molecular weight compound, said microcapsules of said first dispersion agglomerating upon removal of said liquid medium;

admixing an aldehyde resin precondensate with said first dispersion of microcapsules;

maintaining the so-formed admixture in a condition for promoting polycondensation of the precondensate; and then

removing said liquid medium from said admixture to recover a substantially agglomerate-free powder of microcapsules.

14. A process for producing a non-aqueous microcapsule composition comprising

preparing a first dispersion of microcapsules in a dispersing medium, said dispersing medium comprising a liquid medium selected from the group consisting of water and hydrophilic substance and an emulsifier comprising a water-soluble high molecular weight compound, said microcapsules of said first dispersion agglomerating upon removal of said liquid medium;

admixing an aldehyde resin precondensate with said first dispersion of microcapsules;

maintaining the so-formed admixture in a condition for promoting polycondensation of the precondensate to form a second dispersion of microcapsules, said microcapsules of said second dispersion being substantially agglomerate free upon removal of said liquid medium; and then

dispersing said microcapsules of said second dispersion in a non-aqueous medium.

4,601,864

METHOD AND APPARATUS FOR THE PRODUCTION OF POLYMERIC FOAM

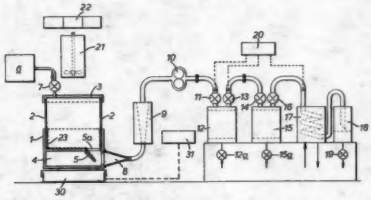
Nicholas C. Vreenegoor, Bennebroek, Netherlands, assignor to Unifoam AG, Glarus, Switzerland

Filed May 15, 1984, Ser. No. 610,493

Claims priority, application United Kingdom, Dec. 6, 1983, 8314010

Int. Cl.[4] B29C *67/22, 39/42*

U.S. Cl. 264—37 **30 Claims**



1. A method of manufacturing polymeric foam, comprising depositing a mixture of foam reactants in a mould, closing the mould and allowing the reactants to react and expand therein; maintaining at substantially atmospheric pressure the space within the mould above the upper surface of the reacting and expanded foam whilst preventing escape to the atmosphere of substantially all gases emanating from the foam, supplying air to the upper surface of the expanded foam following full expansion thereof, drawing at least some of said supplied air downwardly through the foam to entrain gases present therein, extracting the air and entrained gases from the mould through an outlet located in the lower region thereof, and collecting said entrained gases.

4,601,865

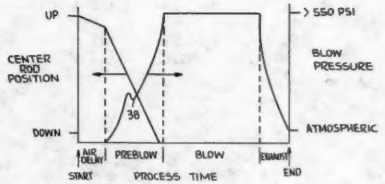
CONTROLLED FEED OF STABILIZING ROD ASSOCIATED WITH CONTROLLED APPLICATION OF BLOWING GAS

Wayne N. Collette, Westmoreland, N.H., assignor to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 250,495, Apr. 2, 1981, Pat. No. 4,372,735. This application Sep. 30, 1982, Ser. No. 420,055

Int. Cl.[4] B29C *49/12, 49/18*

U.S. Cl. 264—40.3 **3 Claims**



1. A method of coordinating the axial stretching of a preform in a blow molding operation with the position of a preform centering rod, said method comprising the step of advancing a preform centering rod from a retracted position to a position substantialy touching or touching a bottom interior of a preform suspended in a blow mold, and then supplying a blowing gas under prressure to the interior of the preform to effect axial elongation of the preform at an axial rate while advancing the preform centering rod at the same axial rate, the

position of the preform centering rod being used as the means for initiating and controling the supplying of blow gas to the preform.

4,601,866

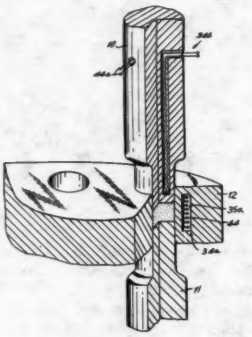
PROCESS FOR TABLET PRODUCTION

Agoston David; Ferenc Kovacs, and Janos Pogany, all of Budapest, Hungary, assignors to Chinoin, Budapest, Hungary

Continuation-in-part of Ser. No. 95,412, Nov. 19, 1979, abandoned. This application Jan. 3, 1984, Ser. No. 567,789

Int. Cl.⁴ B29C *59/02*

U.S. Cl. 264—109 **2 Claims**



1. A process for producing biological, pharmaceutical or edible tablets of uniform quality with minimal waste from a supply of granulated particles, comprising:

(a) introducing a charge of said granulated particles into a die cavity between opposed movable punches within a tabletting press;

(b) moving the two punches toward each other to contact, compress, and bond the granulated particles into a consolidated tablet;

(c) maintaining the temperature of the granulated particles during step (b) at a predetermined value within a range of about 15° to 50° Celsius; and

(d) moving the opposed punches apart and removing the formed tablet.

4,601,867

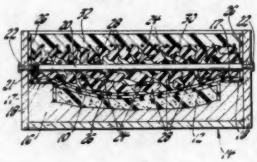
METHOD OF MAKING CAST-TO-SIZE EPOXY TOOLS FOR STAMPING SHEET METAL PANELS

William A. Martell, Sterling Heights, and Ladislaus Weiss, Clawson, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 3, 1984, Ser. No. 627,540

Int. Cl.⁴ B29C *33/40*

U.S. Cl. 264—227 **7 Claims**



1. A method of making a large, cast-to-size, epoxy tool comprising the steps of providing a pattern of the article to be formed by the tool; orienting said pattern in a pattern box; applying a release coating to the surfaces of the pattern and the box which define the surfaces of the tool; coating said surfaces with a thin layer of a tough curable tool surfacing compound; partially filling said pattern box with a liquid epoxy containing at least about 50 volume percent of thermally conductive particulate filler before said surfacing compound fully cures; adding at least about 30 volume percent of the tool volume of chunks of thermally conductive material to said liquid epoxy; filling said box with additional liquid epoxy to cover said chunks; and fully curing said epoxy and surfacing compound such that the internal temperature of the tool never exceeds about 70° C., the presence of the thermally conductive filler and chunks serving to mediate heat generated by the epoxy exotherm to prevent run-away cure, shrink and shape change of the tool with respect to the pattern.

4,601,868

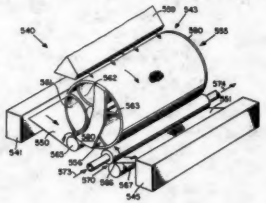
METHOD OF IMPARTING A THREE-DIMENSIONAL FIBER-LIKE APPEARANCE AND TACTILE IMPRESSION TO A RUNNING RIBBON OF THERMOPLASTIC FILM

Clifford J. Radel, Cheviot, and Hugh A. Thompson, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 370,443, Apr. 21, 1982, abandoned, which is a division of Ser. No. 206,410, Nov. 13, 1980, Pat. No. 4,342,314, which is a continuation-in-part of Ser. No. 17,506, Mar. 5, 1979, abandoned. This application Dec. 20, 1983, Ser. No. 563,724

Int. Cl.⁴ B29C *17/14, 17/04*

U.S. Cl. 264—504 **11 Claims**



1. A method of continuously debossing a running ribbon of substantially planar thermoplastic film to produce a resilient three-dimensional web having first and second surfaces and containing a multiplicity of capillary networks, said first surface having a multiplicity of apertures in which said capillary networks originate, each of said apertures being defined by a multiplicity of intersecting fiber-like elements, each of said fiber-like elements exhibiting a substantially uniform U-shaped cross-section along its length, said method comprising the steps of :

(a) continuously bringing said film in contacting relation with a tubular-shaped perforate laminate forming structure exhibiting a three-dimensional microstructure comprising a regulated continuum of capillary networks originating in and extending continuously from the film contacting surface to the non-film contacting surface thereof, each of said capillary networks in said forming structure being defined by a multiplicity of intersecting fiber-like elements interconnected to one another, each of said fiber-like elements further exhibiting a substantially uniform cross-section along its length, said cross-section comprising a base portion and a sidewall portion joined to each edge of said base portion, said intersecting sidewall portions of said interconnected fiber-like elements being interconnected to one another intermediate said film-contacting and said non-film contacting surfaces of said forming structure;

(b) heating a portion of said film in contact with said forming surface above its thermoplastic temperature;

(c) applying a sufficiently great pressure to said heated thermoplastic film to cause those portions of said film which do not coincide with the base portions of said fiber-like elements in said forming structure to substantially conform with each of the intersecting sidewall portions of each of said interconnected fiber-like elements in said forming structure without causing rupture of said film at the points of intersection between said sidewall portions, thereby forming said capillary networks and imparting a three-dimensional fiber-like appearance and tactile impression to said film; and

(d) cooling the debossed film below its thermoplastic temperature to form said resilient web before removing said web from said forming structure.

4,601,869

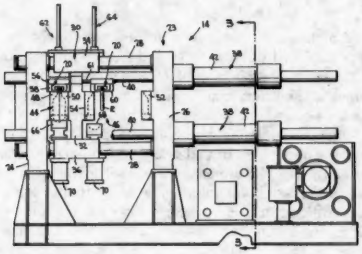
BLOW MOLDING METHOD EMPLOYING A MOLD CLAMP ASSEMBLY

Ieuan L. Harry; Suppayan M. Krihsnakumar, both of Nashua; Walter R. Jolly, Merrimack, and Martin H. Beck, Brookline, all of N.H., assignors to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 244,469, Mar. 16, 1981, Pat. No. 4,365,950. This application Sep. 20, 1982, Ser. No. 420,056

Int. Cl.⁴ B29C *49/32, 49/64*

U.S. Cl. 264—523 **1 Claim**



1. A method of blow molding at one time a plurality of preforms, said method comprising the steps of providing heated preforms in carriers, using the carriers positioning a selected plurality of the heated preforms in one mold unit of a two mold unit clamp assembly, transversely closing the one mold unit on the selected heated preforms and shifting the one mold unit transversely to one side while simultaneously opening the other mold unit and positioning the other mold unit for discharging blow molded articles and receiving a new supply of preforms, while discharging blow molded articles and receiving a new supply of preforms in the other mold unit, blow molding the heated preforms in the one mold unit, and then repeating the step with the other mold unit being closed and the one mold unit being opened, each mold unit having associated therewith a carrier support, each carrier support being moved relative to a respective mold unit during the opening and closing of the mold unit, and each carrier support being automatically moved to a carrier receiving-discharging position when the respective mold unit is fully open.

4,601,870

INJECTION MOLDING PROCESS

Nobuyoshi Sasaki, Yokohama, Japan, assignor to M.C.L. Co., Ltd., Kanagawa, Japan

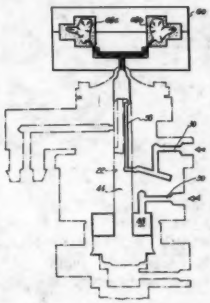
Filed Apr. 23, 1984, Ser. No. 603,114

Claims priority, application Japan, Apr. 27, 1983, 58-72975; Apr. 27, 1983, 58-72976

Int. Cl.⁴ B29C *45/57*

U.S. Cl. 264—572 **4 Claims**

1. A process for molding an article from wax, comprising the steps of cooling a mold having a hollow core portion defining a mold cavity communicating with a sprue runner through a single throttled injection port, said cooling being to a temperature which is lower than the melting point of said wax, injecting said wax while in a molten and low viscosity state into said mold cavity of said mold while it is cooled in response to said cooling step, said injection being through said throttled injection port to allow said molten wax to adhere onto the interior surface of said mold to form a shell, reducing the pressure in said hollow core portion of said shell through said throttled injection port, and then feeding high pressure air into thet hollow core portion of said shell to back up said shell through said throttled injection port until said wax is completely solidified.



4,601,871

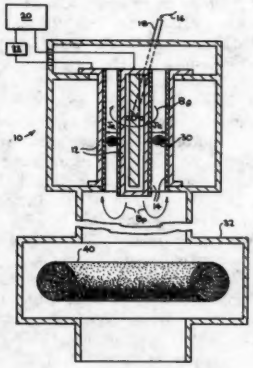
STEADY STATE COMPACT TOROIDAL PLASMA PRODUCTION

William C. Turner, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 17, 1983, Ser. No. 495,386

Int. Cl.⁴ G21B *1/00*

U.S. Cl. 376—144 **15 Claims**



1. An apparatus for maintaining a field-reversed toroidally shaped plasma in a steady state mode comprising:

at least one magnetized coaxial plasma gun for forming a toroidal plasma said means having cylindrically symmetric solenoidal electrodes for generating a poloidal magnetic field;

means for maintaining the radial equilibrium of said toroidal

plasmas after formation, said means being operatively coupled to said plasma gun; and

means for producing magnetic helicity being operatively connected to said electrodes so as to produce increasing magnetic helicity from magnetic flux between said electrodes.

4,601,872

WATER SEALING DEVICE FOR USE IN REPLACING CONTROL ROD DRIVE HOUSING

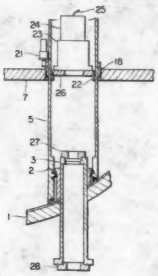
Yoshio Yada; Yasumasa Tamai, both of Hitachi, and Tsugio Iwama, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,905

Claims priority, application Japan, Apr. 15, 1983, 58-66764

Int. Cl.[4] G21C *17/00, 19/20*

U.S. Cl. 376—248 **10 Claims**



1. In a reactor pressure vessel including a core, and a control rod drive housing extending through an opening formed in a wall of said reactor pressure vessel and a stub tube comunicating with said opening and welded to the stub tube through a weld, a water sealing device comprising a sealing cylinder temporarily inserted, when said control rod drive housing and/or said stub tube are replaced by new ones by removing said weld, in a control rod guide tube opening formed in a core support plate of the reactor pressure vessel for providing within the reactor pressure vessel a cylindrical space in which said control rod drive housing is located to shut out water in the core from the vicinity of the control rod drive housing, said sealing cylinder comprising:

centering means mounted on inner and outer peripheral surfaces of said sealing cylinder and comprising:

a tester support portion located on the inner peripheral surface of the sealing cylinder for supporting an alignment tester for testing the alignment of centering targets mounted on upper and lower end portions of the control rod drive housing; and

a tapered centering portion mounted on the outer peripheral surface of the sealing cylinder and brought into contact with a wall of the control rod guide tube opening when the sealing cylinder is temporarily inserted in the control rod guide tube opening, whereby the sealing cylinder can be concentrically mounted in the control rod guide tube opening through the tapered centering portion.

4,601,873

METHOD OF AVOIDING OR INHIBITING INTERMIXING OF THE ATMOSPHERE WHICH EXISTS IN AN ENCLOSED SPACE WITH A GASEOUS SUBSTANCE PRESENT IN THE SAME SPACE

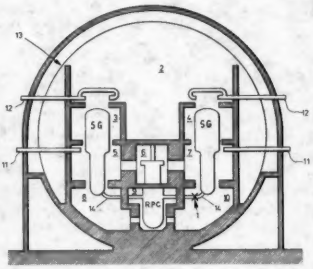
Hermann Jahn, Griegstr. 13, D-8000 München 40, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,392

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127804

Int. Cl.[4] G21C *9/00, 19/00*

U.S. Cl. 376—308 **19 Claims**



1. In a method of avoiding explosive mixtures of hydrogen with air, or of hydrogen with air and steam in the atmosphere within the safety containment of a nuclear reactor in the course of accidents, said safety containment having an upper area and a lower area containing atmospheres of different densities, the improvement comprising reducing the density of the atmosphere in the upper area of said safety containment and increasing the density of the atmosphere in said lower area so as to produce in said safety containment a substantially stable atmosphere stratified into superposed layers of non-explosive mixtures of hydrogen, air and steam so as to prevent further intermixing between hydrogen and oxygen of the air, caused by convection between said lower area and said upper area and avoid said explosive mixtures.

4,601,874

PROCESS FOR FORMING A TITANIUM BASE ALLOY WITH SMALL GRAIN SIZE BY POWDER METALLURGY

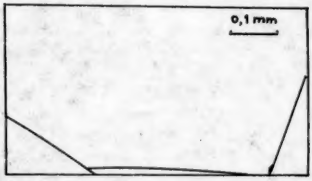
Michel Marty, Buc; Henri Octor, Bagneux, and André Walder, L'Hay les Roses, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales (ONERA), France

Filed Jul. 8, 1985, Ser. No. 752,512

Claims priority, application France, Jul. 6, 1984, 84 10829

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—23 **6 Claims**



1. A process for forming a titanium base alloy having a small grain size, comprising the steps of compacting a powder formed of particles of titanium or of mother alloy thereof, heat treating at a temperature higher than the point of transformation into phase β and quenching wherein the powder further

contains a dispersion of fine particles of a product curbing the growth of the grain size, in a proportion per volume less than that which would lead to the formation of a continuous layer of fine particles about the particles of titanium powder, said product particles being present at the surface of the titanium grains in the alloy obtained.

4,601,875

PROCESS FOR PRODUCING MAGNETIC MATERIALS

Hitoshi Yamamoto, Osaka; Masato Sagawa, Nagaokakyo; Setsuo Fujimura, Kyoto, and Yutaka Matsuura, Ibaraki, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Sep. 15, 1983, Ser. No. 532,471

Claims priority, application Japan, May 25, 1983, 58-90801; May 25, 1983, 58-90802; May 27, 1983, 58-92237; May 27, 1983, 58-92238; Sep. 2, 1983, 58-161626; Sep. 2, 1983, 58-161627

Int. Cl.[4] B22F *3/16;* **C22C** *33/02, 38/32*

U.S. Cl. 419—23 **38 Claims**

1. A process of producing a permanent magnet of the Fe-B-R type comprising:

providing a sintered body having a composition consisting essentially of, by atomic percent, 12–24% R wherein R is at least one element selected from the group consisting of Nd, Pr, La, Ce, Tb, Dy, Ho, Er, Eu, Sm, Gd, Pm, Tm, Yb, Lu and Y and at least 50% of R consists of Nd and/or Pr, 4–24% B, and at least 52% Fe, and

heat-treating the sintered body at a temperature ranging from 350 degrees C. to the sintering temperature in a non-oxidizing atmosphere for at least 5 minutes to increase the intrinsic coercivity of the sintered body.

4,601,876

SINTERED FE-CR-CO TYPE MAGNETIC ALLOY AND METHOD FOR PRODUCING ARTICLE MADE THEREOF

Michio Yamashita, and Setsuo Fujimura, both of Kyoto, Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Division of Ser. No. 297,622, Aug. 31, 1981, abandoned. This application Aug. 13, 1984, Ser. No. 640,111

Int. Cl.[4] C22C *32/00*

U.S. Cl. 419—23 **10 Claims**

1. A method of producing a sintered Fe-Cr-Co type magnet consisting essentially of 20–35% Cr, 3–15% Co and the balance substantially of Fe, which has a maximum energy product $(BH)_{max}$ of 5.0 MGO_e or more comprising:

blending at least one of an Fe-Cr powder and Fe-Cr-Co powder with a carbonyl Fe-powder and, if necessary, a Co-powder to provide a powder blend, the average particle size of said Fe-Cr powder, Fe-Cr-Co powder and the carbonyl Fe-powder being 200 mesh or smaller in size;

compacting the resulting powder blend to provide a compact; and

sintering the resulting compact in a vacuum or a non-oxidizing atmosphere.

6. A method of producing the sintered Fe-Cr-Co type magnet consisting essentially of 20–35% Cr, 3–15% Co and the balance substantially of Fe, which has a maximum energy product $(BH)_{max}$ of 5.0 MGO_e or more comprising:

blending at least one of an Fe-Cr powder and Fe-Cr-Co powder with a carbonyl Fe-powder and, if necessary, a Co-powder to provide a powder blend, the average particle size of said Fe-Cr powder, Fe-Cr-Co powder and the carbonyl Fe-powder being 200 mesh or smaller in size, the surface of these powders having been activated;

compacting the resulting powder blend to provide a compact;

sintering the resulting compact in the vacuum or a non-oxidizing atmosphere; and

cooling the sintered body after sintering from 800° C. to 500° C. at a cooling rate of 5° C./min or higher.

4,601,877

PRESS SINTERING PROCESS FOR GREEN COMPACTS AND APPARATUS THEREFOR

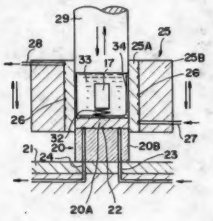
Tadaomi Fujii, Nara; Koji Kitazawa, Ashiya; Yutaka Tomono, Ibaraki; Tomio Takagi, Osaka, and Josuke Kawachi, Ikoma, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Jul. 23, 1985, Ser. No. 758,130

Claims priority, application Japan, Oct. 18, 1984, 59-220271

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—42 **8 Claims**



1. A press sintering process for a green compact comprising inserting the green compact into a pressing container after preheating the green compact to a predetermined temperature, placing into the container a solidifiable pressure medium previously melted by heating, applying a mechanical pressing force to the green compact within the container solely through the pressure medium, the pressing force being produced by mechanical press means adapted to be in direct contact with the pressure medium, positively cooling the container to solidify the outer peripheral portion of the pressure medium and form a solidified shell, taking out from the container the solidified shell containing the sintered green compact and some pressure medium in the molten state, and taking out the compressed sintered product from the solidified shell.

4,601,878

METHOD AND APPARATUS FOR PRODUCING MOULDED BLANKS BY HOT-PRESSING METAL POWDER

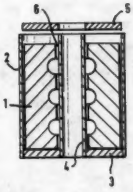
Christer Aslund, Torshälla, and Torbjörn Andersson, Eskilstuna, both of Sweden, assignors to Nyby Uddeholm Powder AB, Sweden

Filed Jul. 1, 1983, Ser. No. 510,237

Claims priority, application Sweden, Jul. 2, 1982, 8204133

Int. Cl.[4] B22F *1/00, 3/00*

U.S. Cl. 419—49 **5 Claims**



1. A method of producing moulded blanks by hot-pressing metal powder within a thin-walled capsule of a sheet metal and incuding an outer sleeve (2) and an inner insertion sleeve (4) disposed coaxially inside the outer sleeve and having a first end of the sleeve sealed with an approximately annular closure base (3) disposed in a fluid-tight connection to said inner sleeve (4) and said outer sleeve (2) and having a second open end, comprising inserting a separable mould (1) into said capsule with

the mould spaced from the inner insertion sleeve (4) to define a mould cavity, inserting metal powder into the cavity from the second open end (6) of said capsule, vibrating the capsule to compress said inserted metal powder, sealing the second open end of the capsule, isostatic pressurizing all sides of said capsules, simultaneously heating said capsule to an elevated temperature to create a hot-isostatic pressing of said metal powder, and removing said separable mould and moulded blank from said capsule after said metal powder has solidified to form said moulded blank.

4,601,879

COPPER-NICKEL-TIN-TITANIUM-ALLOY AND A METHOD FOR ITS MANUFACTURE

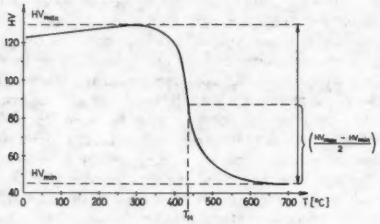
Wolfgang Dürrschnabel, Bellenberg; Heinrich Stüer, Vöhringen; Jörg Steeb, Tiefenbach, and Franz J. Puckert, Illerrieden, all of Fed. Rep. of Germany, assignors to Wieland-Werke AG, Ulm, Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 737,976

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421198; Sep. 1, 1984, 3432226

Int. Cl.[4] C22F *1/08*

U.S. Cl. 420—473 **21 Claims**



1. A copper-nickel-tin-titanium-alloy, consisting essentially of:
0.3 to 2.8% nickel by weight,
0.25 to 3.0% tin by weight,
0.25 to 0.75% titanium by weight,
the remainder being copper and common impurities.

4,601,880

URINE CONTAINER WITH BIOCIDAL ACTIVITY

Patrick S. L. Wong, Kowloon, Hong Kong; Jimmy B. Langston, San Jose, and Harold M. Leeper, Mountain View, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 397,471, Jul. 12, 1982, Pat. No. 4,529,398, which is a division of Ser. No. 137,538, Apr. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 78,507, Sep. 24, 1979, Pat. No. 4,241,733, which is a division of Ser. No. 804,962, Jun. 9, 1977, Pat. No. 4,193,403. This application Apr. 11, 1985, Ser. No. 722,247

Int. Cl.[4] A61L *2/00*

U.S. Cl. 422—28 **1 Claim**

1. A method of aseptic management in and urine collecting reservoir, which method consists of substantially inhibiting the multiplication and precluding the survival of unwanted organisms in the reservoir, the method comprising: (1) admitting into the reservoir a polymeric body formed of a material that substantially maintains its physical and chemical integrity in the presence of fluid admitted into the reservoir, and contains a biocide effective member selected from the group consisting of methenamine mandelate, methenamine camphorate, methenamine iodoform, methenamine salicylate, methenamine sulfosalicylate, methenamine tetraiodide, methenamine anhydromethylene citrate, methenamine sulfamate, and polyoxymethylene ester for inhibiting the multiplication and precluding the survival of the organisms, and contains an acid for producing an acidic pH within the polymer; and (2) releasing the biocide from the polymeric body at a controlled rate in a biocidal effective amount into the reservoir over a prolonged period of time for obtaining the desired results.

4,601,881

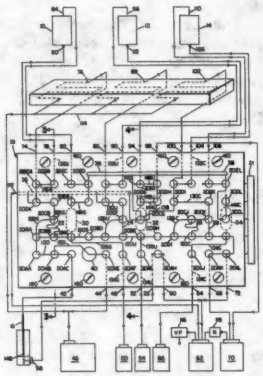
LIQUID HANDLING SYSTEM

Milo E. Webster, Braintree, Mass., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 1, 1984, Ser. No. 667,299

Int. Cl.[4] G01N *21/00, 31/00, 33/00*

U.S. Cl. 422—67 **36 Claims**



33. A system for precise dilution of a liquid comprising:
a face plate member that has a substantially rigid surface,
a flexible sheet member that has a surface at least part of which is adapted for mating engagement with corresponding parts of the rigid face plate surface,
a network of channels in at least one of the members,
first and second chamber regions in said face plate member for isolating accurately predetermined volumes of liquid and for passing said accurately predetermined volumes of liquid to a channel of the network to form a diluted mixture,
a plurality of valve lands in said one member, each of which separates at least two adjacent channels in a member, the lands having surfaces adapted for releasably mating with corresponding parts of the surface of the other member,
a plurality of valve actuators, each associated with a valve land and adapted to flex the sheet member between a first position, in which the valve land of one member mates with the corresponding part of the surface of the other member, and a second position, in which the sheet member is spaced away from the first position to allow flow across the land and between the adjacent channels, and
means for flowing liquid through the system.

4,601,882

OXYGEN ANALYZER

William H. Benner, Danville, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 8, 1984, Ser. No. 608,282

Int. Cl.[4] G01N *31/12*

U.S. Cl. 422—80 **13 Claims**

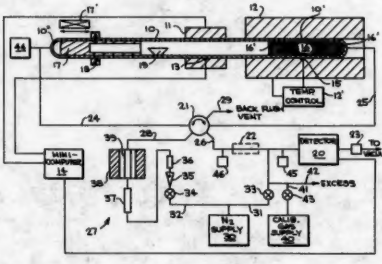
1. An oxygen analyzer comprising:
a pyrolysis tube,
a temperature programmed oven through which said pyrolysis tube extends,
a pyrolysis oven into which said pyrolysis tube extends,
a quantity of granular carbon located in a portion of said pyrolysis tube within said pyrolysis oven and adapted to

be heated to a temperature of about 1135° C. by said pyrolysis oven,

means for moving a sample of material to be analyzed through said pyrolysis tube so as to position a sample of material to be analyzed in either said temperature programmed oven or said pyrolysis oven,

a computer operatively connected to said temperature programmed oven for increasing the temperature of said oven as a function of time,

detector means operatively connected to said pyrolysis oven



to receive gaseous material from said oven, said computer also being operatively connected to said detector means so as to receive input signals from said detector means relative to measurement of gaseous material directed through said detector means, and

means for backflushing said pyrolysis tube with nitrogen gas,

whereby, a sample of oxygen containing material is decomposed and converted to carbon monoxide witin at least one of said ovens for subsequent detection such that microgram quantities of oxygen in a sample being analyzed can be determined.

4,601,883

SENSOR ELEMENT

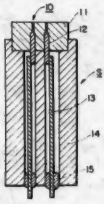
Satoshi Sekido, 53-10, Kurigatani, Hashimoto, Yawata-shi, Kyoto; Hirokazu Tachibana, 151-16, Ninomaru-cho, Mukaijima, Fushimi-ku, Kyoto-shi, Kyoto, and Yoshito Ninomiya, 1-9-4, Nasuzukuri, Hirakata-shi, Osaka, all of Japan

Continuation of Ser. No. 331,325, Dec. 16, 1981, abandoned. This application Jun. 5, 1985, Ser. No. 741,209

Claims priority, application Japan, Dec. 19, 1980, 55-180690; Jun. 12, 1981, 55-91178; Jun. 12, 1981, 56-91179; Jun. 12, 1981, 56-91180

Int. Cl.[4] G01N *27/04*

U.S. Cl. 422—94 **5 Claims**



1. A sensor element which comprises a porous substrate made of a compound oxide of the perovskite type and a pair of electrodes electrically connected to said substrate in a spaced relation with each other, the compound oxide having the formula $A_{1-x}A'_xB_{1-y}B'_yO_3$ in which A represents a trivalent element selected from the group consisting of La, Ce, Pr and Nd, A′ represents a divalent element selected from the group consisting of Ca, Sr and Ba, B represents equal amounts of trivalent and tetravalent Co, B′ represents (a tetravalent element selected from the group consisting of Fe, Mn, V and Ti, x has a value ranging from 0.6 to 0.95 and y has a value ranging from 0.2 to 0.9 with the proviso that x must equal $\frac{1}{2}(1+y)$.

4,601,884

APPLIANCE FOR THE PRODUCTION OF GASEOUS PRODUCTS BY DECOMPOSITION OF LIQUIDS

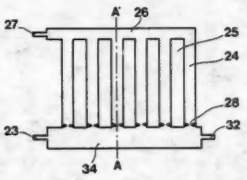
Paul Coeckelberghs, Sint-Pieters-Leeuw, and Willy Depoorter, Brussels, both of Belgium, assignors to Interox (Societe Anonyme), Brussels, Belgium

Filed Jun. 26, 1984, Ser. No. 624,703

Claims priority, application France, Jun. 27, 1983, 83 10714

Int. Cl.[4] G05D *16/00*; B01J *7/02*

U.S. Cl. 422—113 **6 Claims**



1. An apparatus having an oxygen outlet for the production of oxygen by catalytic decomposition of hydrogen peroxide, comprising:

a storage tank containing a hydrogen peroxide solution;

a reactor having an inlet zone in communication with said storage tank and an outlet zone, said reactor containing a catalyst for the decomposition of the hydrogen peroxide;

a liquid receiving vessel in communication with the outlet zone of the reactor;

a hollow conduit;

a heat exchanger; and

a pressure regulating means;

wherein the reactor comprises a horizontal reaction zone comprising the catalyst and a horizontal collection zone located above the reaction zone and connected to said reaction zone by at least one vertical conduit, the inlet zone of the reactor comprising a conduit leading into the reaction zone and the outlet zone of the reactor comprising two conduits, one leading into the reaction zone and the other leading into the collection zone; the hollow conduit is connected at one end to said liquid receiving vessel at a location in the upper portion thereof and at the other end to said heat exchanger at its entrance, and said heat exchanger at its exit is connected to the apparatus outlet; and wherein the pressure regulating means maintains the difference between the pressure in the inlet zone of said reactor and the pressure in the outlet zone of said reactor at a constant positive value; whereby the solution of hydrogen peroxide is introduced into the reactor, a mixture comprising oxygen and water vapor is formed by catalytic decomposition, the mixture passes to the heat exchanger where it is cooled and the water vapor is condensed, and the oxygen passes to the outlet of said apparatus.

4,601,885

STERILIZATION SYSTEM

Harry A. McClure, Carversville, Pa., assignor to Adtech, Inc., Lansdale, Pa.

Filed Jun. 7, 1982, Ser. No. 385,500

Int. Cl.[4] F16K *31/02*; G05D *7/06*; G05B *19/00*; A61L *2/06*

U.S. Cl. 422—114 **9 Claims**

1. A filling machine including sterilizing apparatus, comprising in combination:

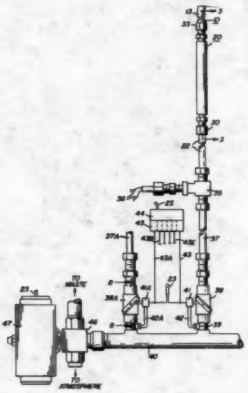
(a) a filling machine of the type having at least one dispensing nozzle having an inlet end normally coupled to a

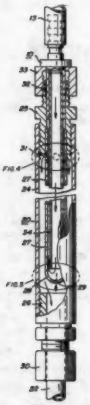
source of product to be dispensed and having an outlet end through which product is discharged,

(b) autoclave means comprising at least one auto clave having an insert opening into which the dispensing nozzle is insertable, sealing means for sealing the autoclave means insert opening with the nozzle therewithin, and a discharge opening,

(c) means for decoupling the nozzle from a source of product to be dispensed and for coupling the nozzle inlet end to a source of fluent sterilizing medium,

(d) pressure regulating means having an inlet coupled to the





discharge opening of said at least one auto clave, an outlet coupled to a discharge line, and adjustable means for controlling the rate of flow of a fluent sterilizing medium through said pressure regulating means from said inlet to said outlet and thereby adjusting the back pressure at the inlet of said pressure regulating means,

(e) selectively actuatable pressure regulating means by-pass means effective when actuated to by-pass said adjustable means for controlling the rate of flow of a fluent sterilizing medium to thereby reduce the back pressure at the inlet of the pressure regulating means, and

(f) control means for actuating said by-pass means.

4,601,886

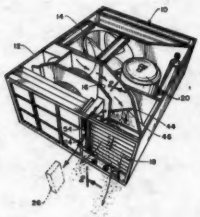
AIR TREATMENT APPARATUS

Richard G. Hudgins, P.O. Box GB, Agana, Guam, 96910

Filed May 24, 1984, Ser. No. 613,565

Int. Cl.[4] G05B *17/00;* **A62B** *7/00;* **A61L** *9/00*

U.S. Cl. 422—116 **4 Claims**



1. In combination with an air conditioning apparatus, said air conditioning apparatus having a housing, air movement means mounted within said housing, said air movement means producing an air stream, an air treatment apparatus being in fluid communication with said air stream, said air treatment apparatus being for emitting an atomized substance into said air stream, said air treatment apparatus comprising:

orifice dispensing means located within said air stream;

a cassette receiving chamber formed within said housing for enclosing and securing a source means therein;

conduit connection means comprising a male section and a female section;

source means containing a quantity of a substance in liquid form, said source means comprising a cassette, said cassette having a valve assembly, said valve assembly being mounted within an outlet tube having a connection end comprising said female section, mounted within said cassette, said cassette being removably connected to said male section by said connection means so that said male section is engageable with said valve assembly, said cassette being located within said cassette receiving chamber when it is connected to said male section; and

pump means mounted within said housing, said pump means being fluidly connected to said source means via an inlet tube connected to said female section and said pump means also being fluidly connected to said orifice dispensing means, said pump means being for moving said substance from said cassette past said valve assembly into said inlet tube to said orifice dispensing means so that it is emitted therefrom as a fine spray.

4,601,887

APPARATUS FOR IMPROVING THE DEGREE OF GRAPHITIZATION OF CARBON BLACK, AND ITS USE

Friedrich-Wilhelm Dorn, Hürth-Hermülheim; Manfred Wolter, Hürth-Knapsack, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Hurth Knapsack, Fed. Rep. of Germany

Division of Ser. No. 269,676, Jun. 2, 1981, abandoned, which is a continuation of Ser. No. 87,052, Oct. 22, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 428,947

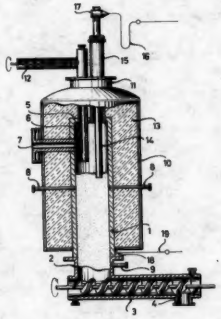
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1978, 2846352

Int. Cl.[4] C01B *31/04;* **C09C** *1/46, 1/56*

U.S. Cl. 422—150 **1 Claim**

1. An apparatus for improving the degree of graphitization of carbon black obtained by thermal conversion of hydrocarbons which are liquid or gaseous under normal conditions (S.T.P.), the carbon black being subjected in a sojourn zone in vertical position at temperatures of at least 1200° C. to countercurrent treatment with chlorine and hydrogen chloride, respectively, and inert gas, the apparatus comprising a graphite tube in vertical position; a steel container concentrically sur-

rounding and being spaced from the graphite tube, the resulting space between the graphite tube and the steel container containing insulating material; a carbon black feed conduit reaching into the graphite tube and terminating in its upper end portion; a graphite electrode reaching into the graphite tube for directly heating downwards flowing carbon black, said graphite electrode and graphite tube defining a sojourn zone, said graphite electrode being displaceable in vertical position



in the sojourn zone, the graphite tube being the actual counter-electrode; feed pipes for the introduction of chlorine containing gas wherein said feed pipes open into the central portion of the graphite tube; an off-gas outlet penetrating into the upper portion of the graphite tube; a water-cooled discharge means having an inlet pipe and an outlet pipe, said inlet pipe, which is connected to the lower end of the graphite tube, is penetrated by a nitrogen feed pipe.

4,601,888

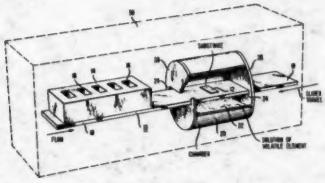
PROTECTION OF SEMICONDUCTOR SUBSTRATES DURING EPITAXIAL GROWTH PROCESSES

Paul R. Besomi, Plainfield; Ronald J. Nelson, Berkeley Heights, and Randall B. Wilson, Edison, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 392,065, Jun. 25, 1982, Pat. No. 4,482,423. This application Jun. 5, 1984, Ser. No. 617,491

Int. Cl.[4] C30B *19/06*

U.S. Cl. 422—253 **3 Claims**



1. Apparatus for fabricating a semiconductor device by the liquid phase epitaxy growth of an epitaxial layer on a compound semiconductor single crystal substrate containing a relatively volatile element, comprising

a solution holder having a well therein for containing a first solution from which said layer is to be grown,

a slider having a recess therein for carrying said substrate to a position under said well,

said holder and said slider being translatable relative to one another for bringing said solution and said substrate into contact with one another, and

a closed chamber which

(1) is located external to said solution holder,

(2) is adapted to permit said slider to translate therethrough,

(3) is capable of surrounding said substrate,

(4) has a top portion above said slider and a bottom portion underneath said slider for containing a second solution which includes said volatile element,

means for moving said slider to position said substrate in said chamber,

means for heating said substrate and said solutions to a temperature suitable for growth of said layer and which causes said volatile element to evaporate from said second solution, so that the partial pressure of said volatile element in said chamber reduces thermal decomposition of said substrate, and

means for removing said substrate from said chamber and for bringing it into contact with said first solution for a time period effective to grow said layer to the desired thickness.

4,601,889

PROCESS FOR THE RECOVERY OF HEAVY METAL

Nagayoshi Sakamoto, and Junichi Kugimoto, both of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Oct. 31, 1983, Ser. No. 546,987

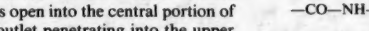
Claims priority, application Japan, Nov. 2, 1982, 57-191759

Int. Cl.[4] C01G *56/00*

U.S. Cl. 423—7 **7 Claims**

1. A process for the recovery of a heavy metal which comprises:

bringing a polymer having pendant groups of the formula:



in which m is hydrogen, sodium or potassium, into contact with an aqueous solution containing a heavy metal to have the heavy metal adsorbed by said polymer;

and

having said heavy metal desorbed from the said polymer.

4,601,890

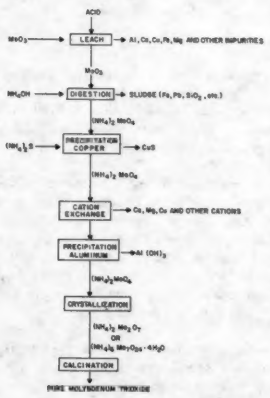
PROCESS FOR PURIFYING MOLYBDENUM TRIOXIDE

Michael J. Cheresnowsky, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 584,844, Feb. 29, 1984. This application Mar. 27, 1985, Ser. No. 716,726

Int. Cl.[4] C01G *39/00*

U.S. Cl. 423—54 **1 Claim**



1. A method for preparing ammonium molybdate having low impurities of iron from an impure concentrate of molybdenum trioxide consisting of contacting said concentrate with from about 0.85 parts to about 3 parts by weight of an aqueous

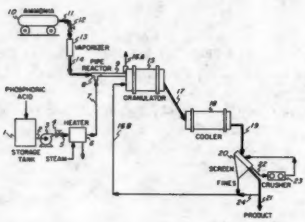
solution comprising about 2 to about 2.7 moles per liter hydrochloric acid and about 1.5 to 2 moles per liter of ammonium nitrate as an oxidant to solubilize a major portion of said iron impurity, and less than about 1 percent of the molybdenum values from said concentrate, washing the resulting concentrate, digesting said resulting concentrate at a temperature of from about 50 to about 60 degrees Centrigrade for a period of about two hours with an aqueous solution of ammonium hydroxide at suitable concentrations to solubilize substantially all of the molybdenum values present in said resulting concentrate as ammonium molybdate and form an ammonium molybdate solution, adding an oxidizing agent to said ammonium molybdate solution to oxidize iron values from a plus two to a plus three oxidation state, adjusting pH of said solution to greater than about 9.5 by adding ammonium hydroxide, further digesting for about one to about three hours at around 50° C. to 60° C. to form an iron precipitate, cooling to about room temperature before liquid-solid separation to decrease iron solubility, separating iron precipitate and sludge from ammonium molybdate solution while maintaining the pH of the molybdate solution above about 9.5 and contacting said resulting ammonium molybdate solution with a chelate iminodiacetate ion exchange resin in ammonium form and concentrating said resulting ammonium molybdate to form ammonium molybdate having low iron impurities.

4,601,891

PRODUCTION OF GRANULAR AMMONIUM POLYPHOSPHATE FROM WET-PROCESS PHOSPHORIC ACID

Kenneth E. McGill, Sheffield, and Johnny R. Gamble, Florence, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Oct. 15, 1985, Ser. No. 787,823
Int. Cl.[4] C01B *15/16, 25/26*
U.S. Cl. 423—305 **4 Claims**



1. An improved process for preparing granular substantially dust-free ammonium polyphosphate of a particle size distribution eminently suitable for subsequent bulk blending with other fertilizer values or eminently suitable for use in production of liquid or suspension fertilizers, which process consists essentially of the steps of:

(a) simultaneously supplying a stream of anhydrous ammonia to the common pipe section of an enlarged pressurized pipe reactor;

(b) simultaneously supplying a stream of phosphoric acid to the cross section of said pipe-cross reactor, said phosphoric acid having a P_2O_5 content in the range from about 50 percent to about 58 percent by weight and a free water content ranging from about 10 percent to 22 percent by weight;

(c) contacting said anhydrous ammonia introduced into said common pipe section of said enlarged pressurized pipe reactor at said cross section of said enlarged pressurized pipe reactor therewith, at a temperature sufficiently high so that additional water is not necessary for continuous operation;

(d) subsequently introducing the reaction product resulting from contacting said anhydrous ammonia and phosphoric acid into a vapor tube extension of said enlarged pressurized pipe reactor to ensure continued intimate contact therebetween;

(e) subsequently discharging from the downstream end of said vapor tube extension a spray of particles of molten material into the upper end of arm inclined rotating drum wherein is maintained a bed of rolling discrete particles of ammonium polyphosphate and on to the rapidly moving granules of substrate maintained therein such that the granules of substrate or seed recycle are increased in size by accretion as the sprayed particles solidify quickly onto the surfaces of said substrate; withdrawing the resulting ammonium polyphosphate material from the lower end of said inclined rotating drum;

(f) introducing said withdrawn material into cooling means;

(g) withdrawing the resulting cooled material from said cooling means;

(h) introducing said material withdrawn from said cooling means into sizing means;

(i) returning particles of pedetermined size from said sizing means into the upper end of said drum; and

(j) withdrawing from said sizing means granular particles of ammonium polyphosphate as product;

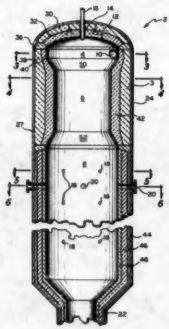
said process characterized by the fact that the proportion of the P_2O_5 as polyphosphate, of the granular product withdrawn from step (j) supra is substantially equal to the proportion of the P_2O_5 as polyphosphate of the melt exiting said vapor tube extention of said pipe reactor in step (d) supra; and said process being further characterized by the fact that the weight percent P_2O_5 withdrawn from step (j) supra is substantially equal to the weight percent P_2O_5 in the melt exiting said vapor tube extension in step (d) supra.

4,601,892

PROCESS FOR PRODUCING CARBON BLACK

C. Jack Hart; Lawrence K. Murray; David L. Rogers, all of Bartlesville, Okla., and Richard T. Divis, Orange, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1983, Ser. No. 480,203
Int. Cl.[4] C01B *31/02*; C09C *1/48*
U.S. Cl. 423—456 **7 Claims**



1. A process for producing carbon black comprising

introducing a hot free oxygen-containing gas generally tangentially into a first generally cylindrical zone having a first diameter of between about 40 and about 80 inches through a tunnel which opens generally tangentially through a refractory sidewall of the generally cylindrical zone;

introducing a carbonaceous feedstock generally axially into the first generally cylindrical zone through an upstream refractory endwall capping the first generally cylindrical

zone for forming a reaction mixture with the hot, free oxygen-containing gas;

flowing the reaction mixture axially from the first generally cylindrical zone and axially into a second generally cylindrical zone having a second diameter which is less than the first diameter and in the range of between about 30 inches and about 72 inches and a length sufficient to provide the reaction mixture sufficient time to pyrolyze and form carbon black-containing smoke;

flowing the carbon black-containing smoke axially from the second generally cylindrical zone and axially into a third generally cylindrical zone having a third diameter which is essentially the same as the first diameter; and

quenching the carbon black-containing smoke with a quench fluid in the third generally cylindrical zone to a temperature of 2000° F. or less.

4,601,893

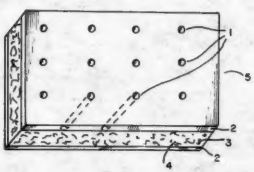
LAMINATE DEVICE FOR CONTROLLED AND PROLONGED RELEASE OF SUBSTANCES TO AN AMBIENT ENVIRONMENT AND METHOD OF USE

John R. Cardinal, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 577,950, Feb. 8, 1984, abandoned. This application Dec. 6, 1984, Ser. No. 678,722

Int. Cl.⁴ A61K *9/20, 9/24*

U.S. Cl. 424—15 **38 Claims**



38. A method for the control of helminths on pasture land, the helminth larvae contamination of which is at or near a minimum level, which comprises grazing on said land ruminant animals having in their rumeno-reticular sacs, a device for the controlled and continuous administration of a water soluble salt of morantel to the aqueous liquid-containing environment in said rumeno-reticular sac over a prolonged period of time, said device comprising

(a) a core sheet comprising a water soluble morantel salt dispersed in a sheet of ethylene vinyl acetate copolymer in an amount corresponding to from 10% to 75% by weight of said core sheet, said core sheet being insoluble in the aqueous liquid-containing environment, resilient, flexible and impermeable to said morantel salt and to said environment;

(b) said core sheet being coated on all sides by ethylene vinyl acetate copolymer which is insoluble in said aqueous liquid-containing environment, resilient, flexible and impermeable to said environment and to said morantel salt;

(c) the thus-produced laminate having one or a plurality of macroperforations extending through all laminae;

(d) said laminate being capable of constrainment by constraining means in a rolled-up configuration, said constraining means being operable to release the constrained laminate when said laminate is placed in said aqueous liquid-containing environment.

4,601,894

CONTROLLED RELEASE DOSAGE FORM COMPRISING ACETAMINOPHEN, PSEUDOEPHEDRINE SULFATE AND DEXBROMPHENIRAMINE MALEATE

Gayda Hanna, Berwyn, Pa., and Winston A. Vadino, Bridgewater, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Mar. 29, 1985, Ser. No. 718,036

Int. Cl.⁴ A61K *9/22, 9/26*

U.S. Cl. 424—19 **13 Claims**

1. An oral dosage form comprising an analgesic-effective amount of acetaminophen, an amount of pseudoephedrine or a pharmaceutically acceptable salt thereof effective in reducing nasal congestion, and an antihistaminic-effective amount of dexbrompheniramine or a pharmaceutically acceptable salt thereof in a uniform matrix comprising a controlled release carrier comprised of a polymer selected from hydroxypropyl methylcellulose ethers or a combination of polymers selected from hydroxypropyl methylcellulose ethers and ethylcellulose.

4,601,895

DELAYED-ACTION ACETYLSALICYLIC ACID FORMULATIONS FOR ORAL ADMINISTRATION

Bernhard Streuff, Cologne, Fed. Rep. of Germany, and Johann Pütter, deceased, late of Wuppertal, Fed. Rep. of Germany (by Elisabeth Pütter, sole heiress), assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 678,626

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346571

Int. Cl.⁴ A61K *9/22, 31/60, 47/00*

U.S. Cl. 424—35 **3 Claims**

1. A acetylsalicylic acid directly compressed dry mixture tablet formulation consisting essentially of by weight 60 to 90% of acetylsalicylic acid, 8 to 40% pregelatinized starch, and 0 to 30% of cellulose powder and cornstarch additives.

4,601,896

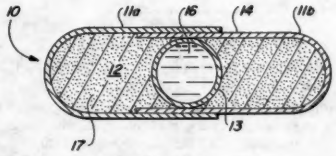
PHARMACEUTICAL CAPSULE COMPOSITIONS AND STRUCTURES FOR GASTRIC SENSITIVE MATERIALS

Mark Nugent, 1202 Stratford La., Algonquin, Ill. 60102

Filed Mar. 21, 1984, Ser. No. 591,972

Int. Cl.⁴ A61K *9/52, 9/66*

U.S. Cl. 424—36 **19 Claims**



1. A pharmaceutical capsule blank adapted for oral administration of gastric-sensitive therapeutic agents, said capsule blank fabricated from a composition comprising a substantially homogeneous and gastric-fluid impervious composition comprising from about 10 to 50 percent by weight of procollagen, from about 40 to 96 percent by weight of at least one material selected from the group consisting of collagen and elastin, and less than 4 weight percent fat and albumin derived from said collagen or elastin source.

4,601,897

PRAZOSIN-PIRBUTEROL COMBINATION FOR BRONCHODILATION

Craig A. P. D. Saxton, Wilton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 6, 1985, Ser. No. 795,689
Int. Cl.[4] A61K *31/505;* A61L *9/04*
U.S. Cl. 424—45 7 Claims

1. A method for relaxing bronchial tissue in a mammalian subject which comprises contacting said tissue with a bronchodilating effective amount of a mixture of from 10 to 90 parts by weight of prazosin or a pharmaceutically acceptable acid addition salt thereof and from 90 to 10 parts by weight of pirbuterol or a pharmaceutically acceptable acid addition salt thereof.

4,601,898

AQUEOUS SOLUTION CONTAINING TiF_4 AND CHELATING AGENT

Roger E. Stier, Clifton, N.J.; William H. Dunn, Brooklyn, N.Y., and James D. Vidra, Lebanon, N.J., assignors to Beecham Inc., Clifton, N.J.

Filed Mar. 27, 1985, Ser. No. 716,491
Int. Cl.[4] A61K *7/18, 33/16*
U.S. Cl. 424—52 14 Claims

1. An anti-caries aqueous solution, consisting essentially of an aqueous solution containing an anti-caries effective amount in the range of from about 0.04 to about 2.5% of TiF_4 and a chelating agent in an amount of from about 0.10 to about 15% and effective to stabilize the TiF_4, said solution having a pH of from about 3.5 to about 5.5, the percentages being by weight based on the total weight of the solution.

4,601,899

HYDROUS TOOTHPASTE CONTAINING TiF_4 AND CHELATING AGENT

Roger E. Stier, Clifton, N.J.; William H. Dunn, Brooklyn, N.Y., and James D. Vidra, Lebanon, N.J., assignors to Beecham Inc., Clifton, N.J.

Filed Mar. 27, 1985, Ser. No. 716,552
Int. Cl.[4] A61K *7/18, 33/16*
U.S. Cl. 424—52 15 Claims

1. An extrudable, shape-retaining aqueous toothpaste which comprises an anti-caries effective amount in the range of from about 0.04 to about 2.5% of TiF_4, a dental polishing or abrasive agent, a chelating agent in an amount of from about 0.10 to about 15% and effective to stablize the TiF_4, and an aqueous dental vehicle, said aqueous toothpaste having a pH of from about 3.5 to about 5.5, the percentages being percentages by weight based on the total weight of the toothpaste.

4,601,900

MOUTHWASH COMPOSITION AND A METHOD FOR PREPARING IT

Asko K. Noponen, and Tapani Pyysalo, both of Espoo, Finland, assignors to Orion-yhtymä Oy Fermion, Espoo, Finland

Filed Mar. 13, 1985, Ser. No. 711,146
Claims priority, application Finland, Mar. 29, 1984, 841252
Int. Cl.[4] A61K *7/22*
U.S. Cl. 424—54 6 Claims

1. An aqueous anticariogenic mouthwash composition consisting of water, ethyl alcohol, conventional auxiliary agents and additives and from about 0.1 to 0.2% by weight of the entire composition of a salt of chlorhexidine selected from the group consisting of chlorhexidine gluconate and chlorhexidine acetate and mixtures thereof and from about 2 to 15% by weight of xylitol to cover the bitter taste of said salt of chlorhexidine.

4,601,901

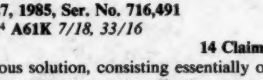
ANHYDROUS NAIL LACQUER CONTAINING AS A RESIN A COPOLYMER COMPRISING UNITS OF VINYLSULFONAMIDE OR A UNSATURATED AMIDE AND OF AN ALKYL ACRYLATE OR METHACRYLATE

Michel Guillon, Bourg-La-Reine; Jean Mondet, Sevran; Christos Papantoniou, Montmorency, and Claudine Vandenbossche, Aulnay-Sous-Bois, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 349,539, Feb. 17, 1982, abandoned. This application Sep. 2, 1983, Ser. No. 528,810
Claims priority, application France, Feb. 18, 1981, 81 03199; Dec. 10, 1981, 81 23098
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.
Int. Cl.[4] A61K *7/04, 31/74*
U.S. Cl. 424—61 9 Claims

1. A nail lacquer comprising a resin and a solvent system, said nail lacquer being anhydrous and said polymer resulting from the copolymerization of:

(1) 75 to 97% by weight of at least one monomer selected from the group consisting of acrylate of ω-methyl or ethyl polyethylene glycol, methacrylate of ω-methyl or ethyl polyethylene glycol and a monomer of the formula:



in which:

R_1 represents a hydrogen atom or a methyl radical and

R_2 represents a linear alkyl radical or branched alkyl radical having 1 to 18 carbon atoms, a mono or dihydroxy alkyl radical, the alkyl radical having from 2 to 4 carbon atoms and a glycidyl radical, and

(2) 3 to 25% by weight of at least one monomer selected from the group consisting of N-vinylsulfonamide, 4-styrenesulfonamide, acrylamide and methacrylamide, said copolymer being present in an amount of 3 to 35% by weight of the nail lacquer composition.

4,601,902

COMPOSITIONS AND PROCESS FOR TREATING HAIR

Petrina F. Fridd, Penarth; Rosemary M. Taylor, Barry, and Michael P. Hill, Saint Lythans, all of Wales, assignors to Dow Corning Ltd., Barry, Wales

Filed Jul. 19, 1984, Ser. No. 632,357
Claims priority, application United Kingdom, Jul. 30, 1983, 8320603
Int. Cl.[4] A61K *7/06*
U.S. Cl. 424—70 7 Claims

1. A composition for treating the hair to improve the manageability, softness and appearance which comprises (1) from 0.025 to 5% by weight of an organosilicon compound selected from (a) silanes represented by the general formula

$$Q_3SiRN^+(R')_3X^-$$

wherein each Q represents an alkyl group having from 1 to 4 carbon atoms, a hydroxyl group, or an alkoxy group or alkoxy-alkoxy group having less than 12 carbon atoms, R represents a divalent organic group having from 3 to 10 carbon atoms selected from the group consisting of aliphatic hydrocarbon radicals, aliphatic hydrocarbon radicals containing ether linkages, hydroxyl-substituted aliphatic hydrocarbon radicals and hydroxyl-substituted aliphatic hydrocarbon radicals containing ether linkages, each R' represents a monovalent hydrocarbon group having from 1 to 18 carbon atoms and X represents a halogen atom, and (b) polydiorganosiloxanes having in the molecule at least one silicon-bonded group represented by the general formula

$$—RN^+(R')_3X^-$$

wherein R, R' and X are as hereinabove defined, at least 40 percent of the total silicon-bonded substituents being methyl groups and any remaining substituents being selected from monovalent hydrocarbon groups having from 2 to 8 carbon atoms, hydroxyl groups and alkoxy and alkoxyalkoxy groups having less than 12 carbon atoms, (2) from 0.025 to 5% by weight of a polydiorganosiloxane having in the formula at least one group represented by the general formula

$$\equiv SiR''NHR'''$$

wherein R'' represents an alkylene group having from 3 to 8 inclusive carbon atoms and R''' represents a hydrogen atom, an alkyl group having from 1 to 4 inclusive carbon atoms or an aliphatic hydrocarbon group attached to the nitrogen atom through a carbon to nitrogen bond and containing at least one group selected from —NH— and —NHZ groups wherein Z represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, at least 50 percent of the total silicon-bonded substituents being methyl groups and any remaining substituents being selected from monovalent hydrocarbon groups having from 2 to 8 carbon atoms, hydroxyl groups and alkoxy and alkoxyalkoxy groups having less than 12 carbon atoms, (3) from 0.01 to 30% by weight of at least one surfactant and (4) from 60 to 99.94% by weight of water.

4,601,903

VACCINE AGAINST *NEISSERIA MENINGITIDIS* GROUP B SEROTYPE 2 INVASIVE DISEASE

Carl Frasch, Rockville, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 1, 1985, Ser. No. 729,206
Int. Cl.[4] A61K *39/095, 39/02*
U.S. Cl. 424—92 **8 Claims**

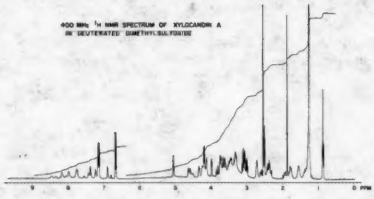
1. A vaccine comprising a single group B, serotype 2b lipopolysaccharide depleted outer membrane antigen from a *Neisseria meningitidis* group B, serotype 2b strain, said vaccine having aluminum containing adjuvant and capable of inducing in a host protective antibodies against both *Neisseria meningitidis* group B, serotype 2a and 2b invasive disease.

4,601,904

ANTIBIOTICS XYLOCANDIN A AND XYLOCANDIN B

Edward Meyers, East Brunswick; Wen-Chih Liu, Princeton Junction, and Richard B. Sykes, Belle Mead, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 474,103, Mar. 10, 1983, abandoned. This application Jun. 25, 1984, Ser. No. 624,557
Int. Cl.[4] A61K *35/00;* C12P *1/04;* C12N *1/20*
U.S. Cl. 424—118 **4 Claims**



1. Substantially pure xylocandin A, or an acid addition salt thereof, having the approximate elemental analysis C, 47.39; H, 7.02; N, 10.57; and having the infrared spectrum in potassium bromide shown in FIG. 1, the 400 MHz ^1H NMR spectrum in deuterated dimethylsulfoxide shown in FIG. 2 and the 400 MHz ^1H NMR spectrum in deuterated dimethylsulfoxide-deuterated water (10:1) shown in FIG. 3.

3. A process for preparing xylocandin A and xylocandin B which comprises cultivating *Pseudomonas cepacia* A.T.C.C. No. 39277 in an aqueous nutrient medium containing an assimilable carbohydrate and nitrogen source under submerged aerobic conditions until substantial antibiotic activity is imparted to the medium and isolating xylocandin A, xylocandin B or both xylocandin A and xylocandin B.

4,601,905

SKIN REGENERATING COMPOSITION AND A PROCESS FOR THE PREPARATION THEREOF

Lajos Széles, Dombóvár, Hungary, assignor to Interag RT, Budapest, Hungary

Filed Mar. 8, 1982, Ser. No. 356,221
Claims priority, application Hungary, Mar. 17, 1981, 662/81
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 **14 Claims**

1. A process for the preparation of a sterile alcoholic extract used as a skin-regenerating or skin-protecting pharmaceutical composition, which comprises the steps of:

(a) extracting the flower, root, fruit or cortex of at least one plant belonging to the Rosaceae family at a temperature of 0° to 50° C. with ethanol of 70 to 100% purity to obtain a plant extract;

(b) subjecting the plant extract to sterile filtration; and

(c) adjusting the plant extract to 0.01 to 0.1% by weight of dry substance content by adding more of the ethanol.

4,601,906

EXTRACTION PROCESS

Brian D. Shindler, West Midlands, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Oct. 10, 1984, Ser. No. 659,527
Claims priority, application United Kingdom, Oct., 1983, 8327756
Int. Cl.[4] A61K *35/78;* A23L *1/28*
U.S. Cl. 424—195.1 **13 Claims**

1. A process for the extraction of a material from a particulate solid comprising the steps of:

(a) charging into an extraction vessel a particulate solid containing an extractable material and a transfer liquid for pressurizing the reaction vessel, the amount of transfer liquid being such that the vessel is pressurized to an elevated pressure,

(b) displacing the transfer liquid from the extraction vessel by transferring into the extraction vessel, at said elevated pressure, an extraction solvent that is adapted to extracture material from particulate solid and is gaseous at ambient temperature and atmospheric pressure, the transfer liquid being liquid both at ambient temperature and atmospheric pressure and at the pressure and temperature at which the displacement is effected,

(c) extracting the material from the particulate solid with the extraction solvent,

(d) separating the extracted material from the extraction solvent, and

(e) after extraction of the material from the particulate solid, discharging the residue of the particulate solid from the extraction vessel.

4,601,907

CHEWY CONFECTION

Leslie F. Knebl, and Ramola Lewis, both of Toronto, Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 3, 1985, Ser. No. 730,225
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—5 **25 Claims**

1. A chewy confection with a chewing gum outer casing and a center filling having a chewy consistency similar to that of the outer casing said filling comprising an aerated plastic blend of:

(a) about 55% to about 90% by weight of a water-soluble,

sweet-tasting chewy candy matrix having dispersed therein;

(1) about 5% to about 20% by weight of fat with a melting point above 22° C.; and

(2) about 0.1% to about 10% by weight of a whipping agent, said plastic blend having a moisture content of about 5% to 20% by weight and obtaining its gum like chewing characteristics without gum base.

4,601,908

PROCESS FOR THE PREPARATION OF PENICILLIN-FREE MYCELIUM MASSES FROM PENICILLIN PRODUCTION CULTURES FORMED BY FERMENTATION, AND THEIR USE AS ANIMAL FEEDS AND FERTILIZERS

Hildegard Ebert, Bad Soden am Taunus, and Richard Kreutzfeldt, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 350,170, Feb. 19, 1982, abandoned. This application Dec. 14, 1984, Ser. No. 682,574

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1981, 3106649

Int. Cl.[4] A23K *1/00*

U.S. Cl. 426—52 **10 Claims**

1. A method for removing residual penicillin from a crude mass of Penicillin mycelium, formed by fermentation in the production of penicillin and containing water and residual penicillin, which method comprises adding to the crude mass at least 1.5 percent by weight of said crude mass of a sugar, convertible to lactic acid by penicillin resistant Lactobacilli and then anaerobically fermenting said mass containing about 2000 to 5000 milligrams of penicillin per kilogram of the dry weight of said crude mass with penicillin resistant Lactobacilli to produce a fermented silage product, said penicilllin resistant Lactobacilli being obtained by adapting naturally occurring penicillin-sensitive Lactobacilli in the presence of Penicillin mycelium.

4,601,909

METHOD OF FREEZING FISHERY PRODUCTS

Kazunori Nagoshi, Matsuyama, Japan, assignor to Tadaaki Sakai, Osaka, Japan

Filed Aug. 6, 1985, Ser. No. 763,022

Int. Cl.[4] A23L *3/36*; F25D *17/02*

U.S. Cl. 426—524 **2 Claims**

1. A method for freezing fishery products which consists of cooling brine to a temperature of −30° C. to −42° C. prepared by adding 0.1 to 0.5% by weight of rapeseed oil to a solution comprising 40% by weight of propylene glycol 10% by weight of calcium chloride and 50% by weight of water, and subsequently immersing the fishery products in said brine.

4,601,910

SOYBEAN COOKING PROCESS

Jerry C. Saub, 2211 Ala Wai Blvd., Apt. #2410, Honolulu, Hi. 96815

Filed Jun. 20, 1985, Ser. No. 746,915

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—634 **8 Claims**

1. A process for cooking soybeans, comprising:

(a) soaking said soybeans whole with hulls intact in a first aqueous solution of the juice of at least one fruit selected from the group consisting of guava, papaya, pineapple, apple and orange, in a plastic vessel, to substantially soften said soybeans, the concentration of said juice in said first aqueous solution ranging from about 1% to about 20% by volume;

(b) boiling said first aqueous solution with said soybeans soaking therein for at least about fifteen minutes until the hulls are subsequently loosened from said soybeans;

(c) recovering said soybeans from said first aqueous solution substantially free of hulls; and

(d) soaking said recovered soybeans substantially free of hulls in a second aqueous solution of the juice of a fruit selected from pineapple, apple, orange, peach, pear and apricot, the concentration of said juice in said second aqueous solution ranging from about 10% to about 20% by volume.

4,601,911

METHOD FOR INCREASING HYDROPHILICITY OF A FABRIC MATERIAL OF SYNTHETIC FIBERS

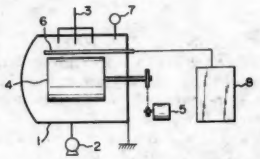
Susumu Ueno; Hirokazu Nomura, both of Ibaraki; Shinobu Hashizume, and Toshiaki Nishide, both of Fukui, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd.; Emori & Co. Ltd. and Nikka Chemical Ind. Co., Ltd., all of, Japan

Continuation-in-part of Ser. No. 692,334, Jan. 17, 1985, abandoned, which is a continuation of Ser. No. 557,659, Dec. 2, 1983, abandoned. This application Jun. 11, 1985, Ser. No. 743,505

Claims priority, application Japan, Mar. 12, 1982, 57-212385; Mar. 12, 1982, 57-212386

Int. Cl.[4] B05D *1/00*

U.S. Cl. 427—34 **2 Claims**



1. A method for increasing hydrophilicity of a fabric material of or mainly composed of a synthetic fiber which comprises the successive steps of:

(a) treating the fabric material with a hydrophilic agent to form a layer thereof on the fiber, the hydrophilic agent being selected from the class consisting of (i) water-soluble acrylic polymers having quaternary-ammonium cationic pendant groups, (ii) water-soluble polyethyleneglycol-grafted cellulose polymers, (iii) water-soluble polyester resins and (iv) water-soluble polyurethane resins; and

(b) then exposing the thus treated fabric material to low temperature plasma generated in an atmosphere of an inorganic gas under a pressure in the range from 0.01 to 10 Torr.

4,601,912

METHOD OF PREPARING A MAGNETIC RECORDING MEDIUM

Yoshihiro Arai, and Ryuji Shirahata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1985, Ser. No. 787,960

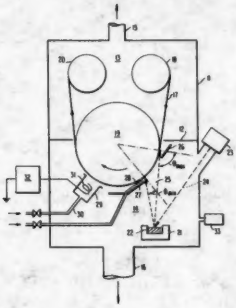
Claims priority, application Japan, Oct. 16, 1984, 59-216927

Int. Cl.[4] H01F *10/00*

U.S. Cl. 427—35 **5 Claims**

1. A method for preparing a magnetic recording medium by forming a ferromagetic vapor deposition film on a non-magnetic support moving along a rotating drum by an oblique incident evaporation method, in which a vapor flow of ferromagnetic metal is vapor-deposited on the support between a maximum incident angle and a minimum incident angle, while introducing a first oxidizing gas near the place where vapor flow of ferromagnetic metal is introduced at the minimum incident angle, and introducing a second oxidizing gas near the surface of the ferromagnetic vapor deposition film on the support which is moving on the rotating drum, wherein the improvement comprises introducing the first and second oxidizing gases so that $\Delta p_2/\Delta p_1$ is not less than 5, wherein Δp_1 is the increase of pressure due to the introduction of the first

oxidizing gas near the place where the vapor flow of ferromagnetic metal is introduced at the minimum incident angle, and



Δp_2 is the increase of pressure due to the introduction of the second oxidizing gas near the surface of the ferromagnetic film after the vapor deposition.

4,601,913

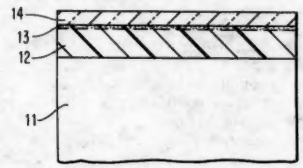
UNDERLAY SURFACE MODIFICATION TO CONTROL RESIN GLASS POLYMERIZATION

Paul N. Chaloux, Jr., Wappingers Falls, and Janos Havas, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 624,878, Jun. 27, 1984, abandoned. This application Dec. 27, 1985, Ser. No. 814,581

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 **8 Claims**



1. A process for modifying a polymeric material surface to facilitate formation of an organosilicon-containing masking material thereon, said process comprising:

treating said polymeric material surface in an oxidizing plasma to form acidic functional groups upon said surface; and

subsequently forming a layer of an organosilicon-containing material on said treated surface.

4,601,914

METHOD FOR FABRICATING A SEMICONDUCTOR GAS SENSOR

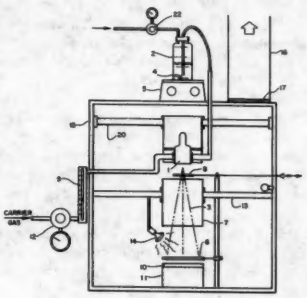
James O. Barnes, and David J. Leary, both of Fort Collins, Colo., assignors to Airtech, Inc., Ft. Collins, Colo.

Division of Ser. No. 385,822, Jun. 7, 1982, Pat. No. 4,453,151. This application May 23, 1984, Ser. No. 613,193

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—87 **7 Claims**

1. A method for manufacturing a semiconductor gas sensor which is capable of exhibiting changes in conductivity proportional to changes in the concentration of specific gases comprising the steps of spraying a sufficient amount of a solid in liquid suspension onto a heated insulating substrate to uniformly cover the substrate to a desired thickness; simultaneously evaporating the liquid from the solids on the substrate during the spraying to form a film, and subsequently heating the resultant film covered substrate at a high enough temperature and for a sufficient period of time to anneal and strengthen the resultant film.



4,601,915

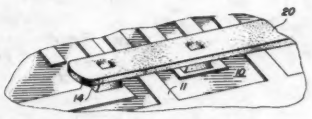
METHOD OF FABRICATING AIR SUPPORTED CROSSOVERS

Donald E. Allen, Gilbert; Richard A. Gross, and Howard D. Knuth, both of Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1984, Ser. No. 653,414

Int. Cl.[4] H01L *21/88*

U.S. Cl. 427—96 **9 Claims**



1. A method of fabricating an air supported crossover device comprising the steps of:

providing a substrate;

cleaning said substrate;

depositing aluminum on said substrate;

masking said aluminum with a first photoresist defining a conductor;

removing said aluminum about said first photoresist

removing said first photoresist providing a metalized substrate;

coating said metalized substrate with a polyimide;

curing said polyimide partially;

delineating a via pattern on said polyimide;

curing said polimide totally;

coating said polyimide coated metalized substrate with a metal layer;

delineating a support pattern on said metal layer;

delineating a crossover pattern on the support pattern; and

removing an excess of said metal layer, leaving said crossover and support.

4,601,916
PROCESS FOR BONDING METALS TO ELECTROPHORETICALLY DEPOSITED RESIN COATINGS

James J. Arachtingi, Massapequa Park, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jul. 18, 1984, Ser. No. 632,041
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—97 **16 Claims**

1. In a process for producing a printed circuit on an insulated metal substrate, which process includes providing one or more insulating layers on surfaces of a metal sheet to form the insulated metal substrate; providing one or more holes through the insulated substrate for through connections; etching the hole walls defined by the metal sheet to enlarge by a predetermined amount only the portion of the holes extending through the metal sheet, electrophoretically depositng a resinous coating comprising a cathodic or anodic electrophoretic thermosetting resin from a solution thereof on the etched portion of the hole walls; curing the resinous coating; and forming the printed circuit on the surface of the insulating layers and on the walls of the holes; the improvement comprising:

incorporating in the resin solution a solid filler in finely divided form and having an average particle size of about 1 micron or less, the filler being non-resinous, inorganic, non-reactive with the solution and uniformly dispersed therethrough, the filler being capable of improving the adhesion of a metal layer to the electrophoretically deposited resinous coating after the coating is adhesion promoted, the resinous coating containing the filler having a volume resistivity greater than 10^4 megohm-cm between the printed circuit conductor and the metal sheet;

electrophoretically depositing the resinous coating and the filler from the solution onto the metal wall portions of the holes, the deposited coating having fillers dispersed therethrough;

curing the resinous coating, the thickness of the cured resinous coating being between about 0.025 mm and about 0.055 mm, the cured resinous coating being comprised of (a) 1% to 25% by weight of said filler, and (b) the balance being said thermosetting resin;

adhesion promoting the surface of the resinous coating containing the filler to create a hydrophilic, microetched surface on the coating;

depositing a metal layer on the surface of the resinous coating on the hole walls, and on the insulating layers, the metal layer deposited on the microetched surface of the resinous coating being continuous and free of blisters, and

forming said printed circuit on the insulated metal substrate.

4,601,917
LIQUID COATING COMPOSITION FOR PRODUCING HIGH QUALITY, HIGH PERFORMANCE FLUORINE-DOPED TIN OXIDE COATINGS

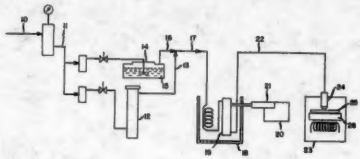
David A. Russo, Edison, N.J., and Georg H. Lindner, Vlissingen, Netherlands, assignors to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 705,595, Feb. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 687,065, Dec. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 598,623, Apr. 10, 1984, abandoned. This application Oct. 4, 1985, Ser. No. 784,279
Int. Cl.[4] B05D *7/22, 5/12;* C03C *17/245*
U.S. Cl. 427—109 **62 Claims**

1. A liquid coating composition for making high quality fluorine-doped tin oxide coatings having a low sheet resistance and high visible light transmission comprising:

(a) 1–30 wt. % of a reactive organic fluorine dopant compound where at least one fluorine atom is located alpha or beta to a functional group wherein carbon is bonded to oxygen, selected from carboxylic acid, anhydride, ester, alcohol, ketone, acid halide, or ether: and

(b) 70–99 wt % of an organotin compound which is an alkyltin trichloride, a dialkyltin dichloride, an alkyldi-

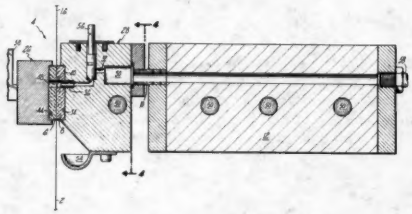


chlorotin acetate, a alkylchlorotin diacetate, or an ester tin trichloride; or tin tetrachloride.

4,601,918
APPARATUS AND METHOD FOR APPLYING HIGH SOLIDS ENAMELS TO WIRE

Mohammad F. Zaman, and Dennis L. Peppler, both of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Aug. 27, 1985, Ser. No. 769,902
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—120 **4 Claims**



1. An apparatus for coating a moving wire with a high solids wire enamel, comprising:

a body having a plurality of enclosed passageways leading from one or more manifolds to a plurality of outlet ports on a surface of the body;

a plurality of first soft, elastic, porous pads each having a discrete, enclosed pipe-like passageway therethrough; and individually attached to the body such that the outlet port is in alignment with the passageway of the pad;

a plurality of second, soft, elastic, porous pads positioned in contact with said first pad thereby forming a guide for the wire to pass between and in contact with said pads such that the wire passes substantially perpendicular to and in front of the passageway, and is substantially, circumferentially surround by said pads;

said first and second pads being shaped to form a cavity between said pads connected to said pipe-like passageway;

a means for drawing said wire to be coated between said pads;

a means for metering a heated, high solids enamel into said manifold under controlled pressure thereby forcing the heated enamel through said passageways, through the first pad pipe-like passageway thereby forming a pool of heated enamel in said cavity between said pads through which the wire maybe drawn and coated.

4. A method of applying a high solids magnet wire enamel to a wire substrate comprising:

heating the enamel to lower its viscosity to below about 200 cps;

introducing the heated enamel into a manifold in a enamel applicator;

passing heated enamel through a discrete, enclosed passageway from the manifold to a discrete, enclosed pipe-like passageway through a first felt pad,

passing a wire substrate substratially perpendicular to and in

front of the discrete, enclosed passageway of the first felt pad and between the first felt pad and a second felt pad in contact with the first felt pad, wherein said pipe-like passageway is conntected to a cavity between said pads, heated enamel is passed through said pipe-like passageway into said cavity, and said wire passes through the enamel in said cavity thereby coating the wire with the enamel;

passing the wire through a curing oven to cure the enamel; and

returning the wire to the applicator for successive enamel applications and cures.

4,601,919

METHOD FOR PREPARING POSITIVE ELECTRODE FOR NON-AQUEOUS ELECTROLYTE CELL

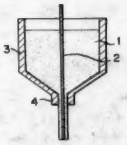
Yoshiaki Asami, Tokyo; Shintaro Suzuki, Ebina; Hirotsugu Fujita, Yono, and Fumiko Homma, Tokyo, all of Japan, assignors to Toshiba Battery Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,188

Claims priority, application Japan, Jan. 18, 1984, 59-6933

Int. Cl.[4] B05D *5/12*; H01M *4/04*

U.S. Cl. 427—126.3 9 Claims



1. A method for preparing a positive electrode for a non-aqueous electrolyte cell which comprises the steps of (1) applying a mixture of positive electrode-active material, an electrically conductive agent, a dispersion of polytetrafluoroethylene, polyacrylic acid and water on one side or both sides of a supporting material, and (2) then drying said supporting material at about 250° C. for 5 to 10 hours.

4,601,920

PROCESS FOR THE PREPARATION OF COLOR DEVELOPER SHEETS FOR PRESSURE-SENSITIVE RECORDING

Hirofumi Mitsuo, and Keiso Saeki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1984, Ser. No. 582,500

Claims priority, application Japan, Feb. 22, 1983, 58-29114

Int. Cl.[4] B41M *5/22*

U.S. Cl. 427—150 20 Claims

1. A process for preparing a color developer sheet for pressure-sensitive recording, comprising the steps of:

dissolving an aromatic carboxylic acid metal salt in an organic solvent, wherein the organic solvent is such that the viscosity of a 50% by weight solution of the aromatic carboxylic acid metal salt in the organic solvent at 35° C. ranges between 200 and 4,000 centipoises;

emulsifying the resulting solution in water to prepare a coating solution; and

coating the resulting coating solution on a support base.

4,601,921

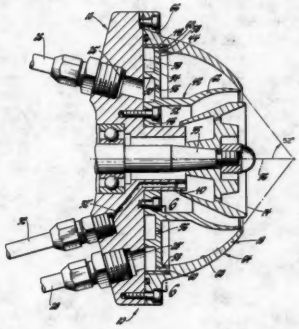
METHOD AND APPARATUS FOR SPRAYING COATING MATERIAL

Hsai-Yin Lee, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1984, Ser. No. 686,081

Int. Cl.[4] B05D *3/12*

U.S. Cl. 427—240 14 Claims



1. A paint spray apparatus having a rotary head defining a forward rim for the centrifugal dispersion of paint,

a vortex plenum surrounding the head and having an annular discharge slit to the rear of the rim for projecting a conical sheath of air around and adjacent the rim to direct the paint in a forward and inward direction, and

means for controlling the air flow from the plenum including a first air input means for admitting air to impart a forward flow direction to the sheath of air and a second air input means for admitting air to impart a tangential flow direction to the sheath of air,

whereby the sheath air velocity is controlled to determine the paint spray pattern from the head.

4,601,922

METHOD OF FORMING A LAYER OF THIN FILM ON A SUBSTRATE HAVING A MULTIPLICITY OF MESH-LIKE HOLES

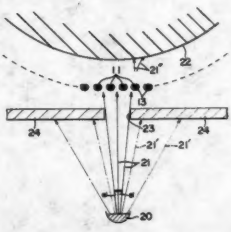
Yasuo Moroboshi, and Akira Nishiwaki, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1984, Ser. No. 649,858

Claims priority, application Japan, Sep. 21, 1983, 58-174769; Sep. 21, 1983, 58-174770; Sep. 21, 1983, 58-174771; Sep. 21, 1983, 58-174772; Sep. 21, 1983, 58-174773; Sep. 21, 1983, 58-174774

Int. Cl.[4] C23C *16/00*

U.S. Cl. 427—248.1 9 Claims



1. A method of forming a thin layer on a substrate having a multiplicity of mesh-like holes by means of vapor deposition, characterized in that shield means with a slit is provided in the

proximity of said substrate and particles of a material constituting said thin layer are caused to fly through said slit in such a direction that they reach the surface of said substrate at substantially a right angle.

4,601,923

MOLD FOR MANUFACTURING OBJECTS BY A CENTRIFUGAL CASTING METHOD

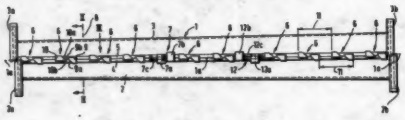
Emil Bonato, Königswinter, Fed. Rep. of Germany, assignor to Centricon Maschinenbau Emil Bonato & Co. KG, Koenigswinter, Fed. Rep. of Germany

Filed Jun. 13, 1985, Ser. No. 745,002

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3423953

Int. Cl.[4] B28B *21/80*; B29C *41/04*

U.S. Cl. 425—425 **10 Claims**



1. A mold for manufacturing tubular objects in accordance with a centrifugal casting concrete method, comprising at least two mold shells which are openable and closeable to each other, each shell having a longitudinal flange extending along an axis of elongation of the mold, the longitudinal flanges of two shells being parallel to each other and opposing each other at two sides of the mold; clamping means on said flanges for clamping said shells to each other and including a plurality of locking wedges rigidly connected to said flanges and projecting outwardly therefrom and arranged in pairs on two opposing flanges so that the locking wedges of each pair are interengageable with each other in a comb-like fashion upon a relative displacement of said shells in the direction of said axis, the locking wedges of each pair having oblique surfaces facing each other and cooperating with each other so that the oblique surfaces of the locking wedges of each pair extend in a plane of separation between two shells when the latter are in a clamped position.

4,601,924

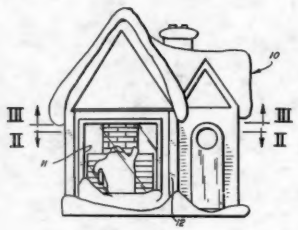
SPECIAL LIGHT EFFECT VISUAL ORNAMENTS

Stephen Birkes, Levasy; Donna L. Hill, Independence, both of Mo., and Kurt Pfahl, Leawood, Kans., assignors to Hallmark Cards, Inc., Kansas City, Mo.

Filed Oct. 15, 1984, Ser. No. 660,915

Int. Cl.[4] A47G *33/08*

U.S. Cl. 428—7 **22 Claims**



1. A self-contained portable tree ornament or the like, comprising: a miniature enclosure of a size which permits hanging on a Christmas tree and including a wall portion having a window therein, first and second object means within said enclosure, and view presentation means within said miniature enclosure for operation in a first mode to present a first scene with only said first object means in view through said window and for operation in a second mode to present a second scene with said second object means in view through said window, said view presentation means being operable in repetitive cycles with said first and second scenes being sequentially presented to view through said window during each cycle.

4,601,925

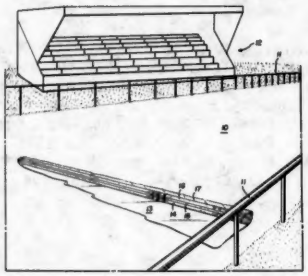
RACE TRACK CUSHIONING SURFACE

Samuel K. Hsu, 14 Po Shin Street 1st Fl., Hong Kong, Hong Kong

Filed Oct. 18, 1984, Ser. No. 662,138

Int. Cl.[4] B32B *5/26, 25/10*

U.S. Cl. 428—17 **1 Claim**



1. A cushion for use on top of a hard paving material in a race track or playing field consisting of three rubber-coated coconut husk fiber bodies superimposed on each other, each of said bodies comprising a mass of coconut husk fibers treated with rot resistant material and compressed into a carpet-like slab and natural rubber latex coating the coconut husk fibers and vulcanized to bond them together as a coherent flexible body, said superimposed bodies being adhesively bonded to each other by rubber adhesive to form a three layer cushion having an upper layer substantially one inch thick, a middle layer substantially one-half inch thick, and a lower layer substantially one inch thick, said middle layer having its coconut husk fibers compressed to a lesser extent than the compression of the fibers in said upper and lower layers.

4,601,926

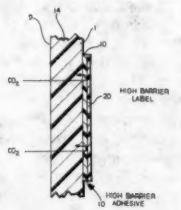
PROCESS FOR APPLYING COPOLYESTER BARRIER LAYER ON POLYESTER CONTAINER

Saleh A. Jabarin, Holland, and Gregory M. Fehn, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 24, 1985, Ser. No. 694,375

Int. Cl.[4] B65D *23/08*; B29C *45/14*

U.S. Cl. 428—35 **13 Claims**



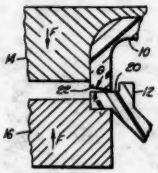
13. A hollow polyester or copolyester container having an outer sidewall surface, a high barrier copolyester material label bonded to the outer sidewall surface by a boundary layer

between the container sidewall and the label formed by a copolyester adhesive layer of the label contacting and adhered to the sidewall surface, the copolyester layer material being a reaction product of isophthlatic acid, ethylene glycol and 1,3 bis (2-hydroxyethyoxy) benzene.

4,601,927
WELDING OF PLASTIC PARTS

David W. Durfee, Rochester, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed May 11, 1984, Ser. No. 609,386
Int. Cl.[4] B29C *65/06*
U.S. Cl. 428—35 **33 Claims**

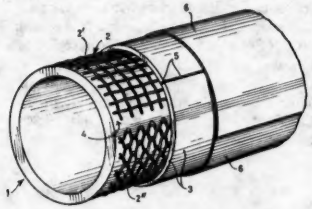


1. The method of welding plastic parts to provide a weld joint between surfaces thereof, which extend between opposite sides of said parts, with reduced stresses and reduced susceptibility to solvent induced cracking and crazing, which comprises the steps of locating at least one of said surfaces at an angle between 2 degrees and 30 degrees from the other of said surfaces thereby melting said at least one of said surfaces non-uniformly to provide a line of contact between said surfaces which progresses faster towards one of said opposite sides than the flow of molten material towards said one side and molten material is confined away from said one side and allowing said surfaces to fuse while in joined relationship whereby the weld joint is formed between said surfaces when they cool.

4,601,928
PRINTING SLEEVE

Hendricus J. van der Velden, Cuyk, Netherlands, assignor to Stork Screens B.V., At Boxmeer, Netherlands

Division of Ser. No. 559,214, Dec. 8, 1983, Pat. No. 4,554,040. This application Jul. 8, 1985, Ser. No. 752,957
Claims priority, application Netherlands, Dec. 8, 1982, 8204751
Int. Cl.[4] B32B *7/00*; D04B *1/00*
U.S. Cl. 428—36 **11 Claims**

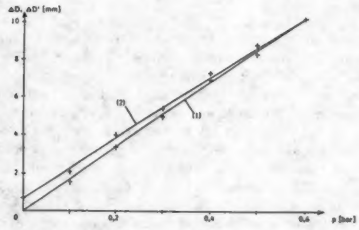


1. A cylindrical sleeve for a printing cylinder obtained by a method comprising the steps of (1) providing a rigid support means which has cylindrical outer surface which is entirely smooth from one lateral side thereof to the other lateral side thereof, (2) placing a fabric made of fiber multifilaments around said cylindrical outer surface so as to be in direct contact therewith, said fabric extending between the lateral sides of said cylindrical outer surface, the total thread thickness of the multifilaments used therein being between 10 and 200 microns and the mesh value thereof being between 2 and 25 meshes/inch, (3) applying a sheet of a thermoplastic, elastomeric material around the outer surface of said fabric, said thermoplastic, elastomeric material being hardenable under the influence of light, and (4) simultaneously applying a vacuum to the sides of the fabric adjacent the opposite lateral sides of said cylindrical outer surface and heating the support means, the fabric and the sheet of thermoplastic, elastomeric material, resulting in said sheet of thermoplastic elastomeric material becoming bonded to said fabric and to the outer surface of the support means, thus forming the cylindrical sleeve.

4,601,929
SINGLE-LAYER ELASTIC TUBULAR FILM OF POLYAMIDE USED FOR PACKAGING PASTE SUBSTANCES AND A PROCESS FOR THE PRODUCTION OF SUCH FILM

Gayyur Erk, Gorsheimertal, and Rudi Korlatzki, Laudenbach, both of Fed. Rep. of Germany, assignors to Naturin-Werk Becker & Company, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 517,137
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1982, 3227945
Int. Cl.[4] F16L *1/00*; B65D *85/00*
U.S. Cl. 428—36 **9 Claims**



1. A single layer tubular film of polyamide used for packing and casing foodstuffs in paste form, especially foodstuffs that are packed when hot or are subject to heat treatment after packing, wherein the tubular film:

consists of at least one polyamide that can absorb at least 5% of its weight in water up to saturation;

is completely thermofixed; and

displays the following elastic behaviour:

(i) at room temperature, when saturated with water, at an internal pressure between 0 and 0.6 bar, expands cylindrically and evenly according to the equation (1) $\Delta D = m \times p + c$; and

(ii) when the internal pressure is released to between 0.6 and 0 bar, contracts cylindrically according to the equation (2) $\Delta D' = m' \times p + c'$, wherein:

ΔD is the difference in diameter expansion in (mm) during internal pressurization;

$\Delta D'$ is the difference in diameter contraction in (mm) during internal pressure release;

m is the upward slope of a plot of ΔD vs internal pressure;

m' is the upward slope of a plot of $\Delta D'$ vs. internal pressure;

p is the internal pressure in (bar);

c is the ordinate intersection of equation (1), with c equal to zero;

c' is the ordinate intersection of equation (2);

the absolute values for m and m' lie between 23 and 6, and for a given diameterr the values for m and m' vary by no more than 20%;

c' is always less than 4.5 mm; and

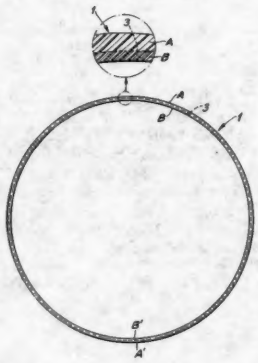
equations (1) and (2) apply in the internal pressure range between 0 and 0.6 bar, respectively.

4,601,930

CARRIER FILM BACKED WITH COMPOSITE FILM

Herbert Engelsberger, Viersen, Fed. Rep. of Germany, assignor to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,617
Int. Cl.[4] B27N 5/02
U.S. Cl. 428—36 4 Claims



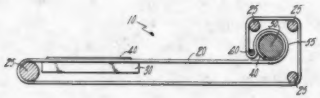
1. In a multilayer film composed of a single or multilayer support film laminated to a composite film, the improvement which comprises said composite film being formed from a folded coextruded blown tube having at least two contiguous layers, one of which is an outermost layer and the other of which is an innermost layer, the contacting surfaces of the outermost and innermost layers being fused to one another, and said innermost layer being folded and heat-bonded upon itself, said tubes further having up to three additional layers between the outermost and innermost layers, said additional layers and said outermost and innermost layers being different from one another and having mechanical shock resistances which differ by at least 25 cN, at least one of said innermost or outermost layers having a mechanical shock resistance greater than 100 cN as measured by ASTM D 1709-62, the outermost layers being selected from the group consisting of LLDPE having a melt index from 0.2 to 4 and LDPE having a melt index from 0.2 to 4 and the innermost layers being selected from the group consisting of LLDPE having a melt index from 0.2 to 4, and LDPE having a melt index from 0.2 to 4, and polyethylene/vinyl acetate copolymer.

4,601,931

HIGH DENSITY, MOISTURE RESISTANT MICA CYLINDERS

Arthur F. Doyle, Portsmouth, and Dennis J. Sklarski, Deerfield, both of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 649,348, Sep. 11, 1984, abandoned. This application Sep. 16, 1985, Ser. No. 776,108
Int. Cl.[4] B32B 15/02
U.S. Cl. 428—36 5 Claims



1. A high density, fracture tough, moisture resistant cylindrical mica composite comprising one or more paper layers consisting essentially of mica, each impregnated with about 5 percent to about 20 percent by weight of a polysiloxane binder, said binder containing about 1 percent to about 4 percent by weight of an organic titanate and about 0.5 percent to about 2 percent by weight of a metal naphthenate, the composite absorbing about 0.5 percent by weight of water after 24 hours of immersion in 23° C. temperature water.

4,601,932

RINGS FOR FLUID DRIVE ASSEMBLIES

John B. Steel, 45 Vereker Drive, Sunbury-on-Thames, Middlesex TW16 6HG, United Kingdom

Filed Jan. 12, 1982, Ser. No. 338,878
Claims priority, application United Kingdom, Jan. 20, 1981, 8101646
Int. Cl.[4] B32B 1/08, 5/12; F16L 11/00
U.S. Cl. 428—36 6 Claims

1. Elongate material for forming a ring for a fluid drive assembly, the material comprising:

a substrate in a cured matrix of thermosetting resin shaped to a predetermined cross-sectional configuration corresponding to the cross-sectional configuration of the ring, said substrate including fibres aligned in more than one direction;

the substrate comprising:

a first substrate material formed from a tape with fibres aligned in more than one direction,

a second substrate material formed from a tape with fibres aligned in more than one direction,

a third substrate material formed from a fibrous bundle, the fibres of said fibrous bundle being aligned unidirectionally in the direction of elongation of the material, said third substrate material being sandwiched between said first substrate material and the second substrate material; and

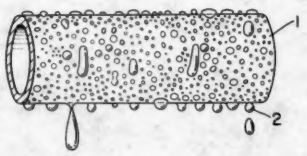
the material being flexible about axes perpendicular to its axis of elongation.

4,601,933

HEAT TRANSFER PROMOTERS AND METHOD OF USING THE SAME

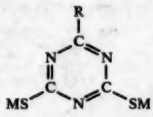
Yoshiro Nakamura 2-8-51, Takamatsu; Kunio Mori 4-17-20, Takamatsu, both of Morioka; Minoru Okumura, Hiratsuka; Yoshio Mochida, Ebina, and Matsuo Miyazaki, Yokohama, all of Japan, assignors to Yoshiro Nakamura; Kunio Mori, both of Morioka and Kabushiki Kaisha Toshiba, Kawasaki, all of Japan

Filed Oct. 18, 1984, Ser. No. 662,027
Claims priority, application Japan, Oct. 19, 1983, 58-195808
Int. Cl.[4] F16L 9/02; F28F 19/02; C09K 5/00; B05D 3/04
U.S. Cl. 428—36 15 Claims



11. A heat transfer device including a heat transfer tube having a gas-condensing surface produced by a process com-

prising the step of treating the surface with a heat transfer promoter containing a triazine-dithiol derivative represented by the general formula



wherein R represents —NHR' or —NR_2' wherein: R' is a hydrocarbon group; M is selected from hydrogen, alkali metals, and alkaline earth metals; and at least one of M groups is an alkali metal or alkaline earth metal.

4,601,934

MASKING OF ELECTRICAL PRINTED CIRCUIT BOARDS

James A. Beverly, 529 Lomax, Idaho Falls, Id. 83401

Filed Jul. 27, 1984, Ser. No. 634,975
Int. Cl.[4] B32B *7/06, 7/12*
U.S. Cl. 428—40 **6 Claims**

1. A masking comprising, in combination, a polyvinyl alcohol film, which is uniformly annealed to be free of stress and strains and which is water-soluble at a temperature of 120° F., and a water-soluble adhesive on said film, said adhesive having a stiffness of between about medium soft and about medium; said masking material having a moisture level of below about 2% by weight.

4,601,935

EPDM LAMINATE

Fredric D. Metcalf, Rootstown, and John G. Sommer, Hudson, both of Ohio, assignors to GenCorp Inc., Akron, Ohio

Filed May 6, 1985, Ser. No. 730,910
Int. Cl.[4] B32B *3/08, 27/08*
U.S. Cl. 428—57 **5 Claims**

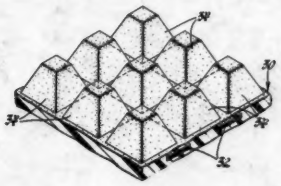
1. A laminate comprising two cured, carbon black reinforced rubbery EPDM membranes joined together at their primed seams by a seaming tape comprising a lightly cured to a low cross-link density, carbon black reinforced, compounded, tacky and rubbery composition comprising from about 40 to 60 parts by weight of polyisobutylene having an average viscosity molecular weight $\overline{M}v \times 10^{-4}$ of from about 0.60 to 1.40 and from 60 to 40 parts by weight of at least one rubber selected from the group consisting of butyl rubber, chlorinated butyl rubber and brominated butyl rubber having a raw Mooney viscosity (ML 1+8 at 212° F.) of from about 18 to 75 and an unsaturation of from about 0.6 to 2.5 mol %, said tape exhibiting a peel strength of at least about 2.5 pli at about 158° F. against said membranes.

4,601,936

GLASS FIBER MAT REINFORCED PLASTIC PANELS WITHOUT THE FIBER READOUT DEFECT

Hamid Ghavamikia, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1985, Ser. No. 718,653
Int. Cl.[4] B32B *3/30*
U.S. Cl. 428—119 **2 Claims**



1. A reinforced plastic panel comprising a mat of glass fibers inpregnated with a plastic material, said panel having a textured surface formed concurrently with said panel and comprising a multiplicity of minute truncated pyramids of substantially equal height, each of said pyramids being substantially free of glass fibers and having a surface substantially parallel to the plane of said panel, whereby said surface of said pyramid defines the outermost surface of said reinforced panel which is free of the attendant undesirable appearance otherwise resulting from the presence of said fibers on said surface and is readily decorable in a subsequent process.

2. A predecorated plastic panel comprising a predecorated plastic sheet laminated by adhesive means to a substrate molded of glass fiber mat impregnated with plastic material, said substrate having a textured surface formed concurrently with said substrate and comprising a multiplicity of minute truncated pyramids of substantially equal height, each of said pyramids being substantially free of glass fibers and having a surface substantially parallel to the plane of said substrate whereby said surface of said pyramid defines the outermost surface of said substrate which is free of the attendant undesirable appearance otherwise resulting from the presence of said fibers on said substrate surface.

4,601,937

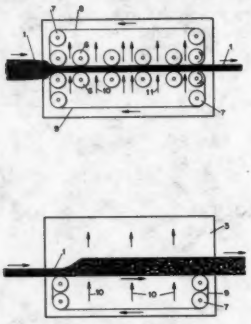
TEMPORARY COMPACTION OF FIBER NON-WOVENS

Eberhard Latussek, Wesel, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Oct. 17, 1983, Ser. No. 542,832
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1983, 3248753
Int. Cl.[4] B65B *63/04;* **D04H** *1/44*
U.S. Cl. 428—132 **6 Claims**

1. A temporarily and reversibly, under steaming conditions, compacted nonwoven matting of up to within one fifth its original thickness, said matting having been heated while in a compacted state to a temperature below that to change the

state of aggregation of the fibers and cooled while compacted to retain said compaction until released.



5. The temporarily and reversibly compacted matting of claim 1, further comprising slits, cuts or punched holes in said matting to reduce the stiffness thereof for rolling or bundling.

4,601,938

ARTICLE SUITABLE FOR WIPING SURFACES

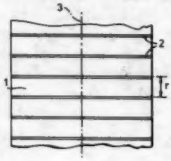
Martin J. Deacon, Rushden; Geoffrey Forrest, Wellingborough, and Gavin B. Rowe, Ringstead, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 385,193

Claims priority, application United Kingdom, Jun. 18, 1981, 8118803

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—153 **13 Claims**



1. An article suitable for wiping surfaces which comprises an elongate web substrate impregnated with a liquid composition, the substrate being divided along its length into a plurality of individual areas by a pattern of barrier material, capable of preventing or substantially reducing the migration of the liquid composition from one individual area to the next, said barrier material penetrating through the whole thickness of the substrate, the substrate not being impregnated with liquid in regions occupied by said barrier material, said pattern being such as to constitute a plurality of barriers each extending across the whole width of the substrate, and the repeat spacing of said pattern at least 8 mm.

4,601,939

COMPOSITE INSULATOR STRUCTURE

George S. Gati, Wappingers Falls; Albert P. Lee; Geraldine C. Schwartz, both of Poughkeepsie, and Charles L. Standley, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1983, Ser. No. 534,036

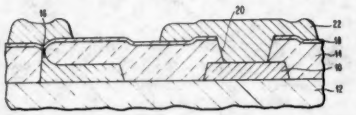
Int. Cl.⁴ B32B *3/02*

U.S. Cl. 428—161 **6 Claims**

1. In a semiconductor device having at least two levels of metallization, wherein the top surface of the one of said levels of metallization which is closer to said device is characterized by a bulge caused by a contaminant or unwanted projection, a composite insulator deposited between said levels of metallization for reducing insulator failures between said levels of metallization, said composite insulator comprising:

a first layer of dielectric material on said top surface of one of said levels of metallization which is closer to said device,

the upper surface of said first layer being planar, and



a second substantially conformal layer of dielectric material on said first layer,

said second layer comprising plasma deposited SiO_x, Si_xN_y or silicon oxynitride,

said first layer being thicker than said second layer,

said second layer being in contact with another of said levels of metallization.

4,601,940

PADDED KNIT FABRIC, PARTICULARLY FOR LINGERIE, AND METHOD OF ITS MANUFACTURE

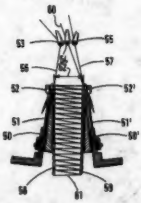
Arwed W. Fischer, Ambergerstrasse 48, 8584 Kemnath-Stadt, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,615

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233793

Int. Cl.⁴ B32B *1/00*

U.S. Cl. 428—178 **25 Claims**



1. Warp, or tricot, or Raschel knitting machine knit padded supple textile fabric, particularly for lingerie, having

a knit tricot outer fabric layer (**58**) of warp, or tricot, or Raschel machine knit yarn material;

a knit tricot inner fabric layer (**59**) spaced from the outer fabric layer and essentially parallel thereto, of warp, or tricot, or Raschel machine knit yarn material; and

a textile yarn filler material (**61**) located in the space between said outer and inner fabric layers,

wherein, in accordance with the invention,

the textile yarn filler material comprises filler yarn (**61**) warp, or tricot, or Raschel machine knit together with the inner and the outer fabric layers, extending in the space between the fabric layers and formed of elongated sinker loops which are interknit with and bound into the inner and outer knit layers, respectively, and connecting said inner and outer layers together.

4,601,941

HIGH HEAT METAL-POLYMER LAMINATE

Robert G. Lutz, and William P. Gergen, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 7, 1984, Ser. No. 648,099
Int. Cl.[4] B32B 7/02
U.S. Cl. 428—213 21 Claims

1. A metal-polymer-metal structural laminate having an unexpected property balance of high stiffness, good adhesion between polymer and metal, and automotive paint bake oven stability, said laminate comprising a core of polymeric resinous material having tightly adhered to each side thereof a metal skin layer wherein:

(a) said metal skin layer is about 5 to about 40 mils thick;

(b) said laminate has a ratio of core thickness to skin thickness of between about 1:2 and about 20:1;

(c) said laminate total thickness is between about 15 mils and about 300 mils; and

(d) said polymeric resinous material comprises the admixture obtained by intimately mixing about 4 to about 96 parts by weight of an elastomeric block copolymer and about 96 to about 4 parts by weight of an engineering thermoplastic resin so as to form at least partial continuous interlocking networks wherein

(i) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

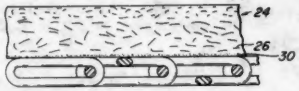
(ii) said engineering thermoplastic resin has a generally crystalline or amorphous structure and a crystalline melting point or glass transition point over about 120° C.

4,601,942

LAMINATED SOFT FACED-SPIRAL WOVEN PAPERMAKERS FABRIC

William A. Finn, Summerville, S.C., and Harry I. Searfass, Wayne, Pa., assignors to Asten Group Inc., Devon, Pa.

Continuation of Ser. No. 639,959, Aug. 10, 1984, Pat. No. 4,528,236. This application Jul. 8, 1985, Ser. No. 752,935
Int. Cl.[4] D03D 13/00
U.S. Cl. 428—222 31 Claims



1. An improved papermakers fabric of the type having synthetic monofilament yarns interconnected to define an under layer and a batt which defines an upper layer united in a single fabric by adhesive means, the improvement characterized by:

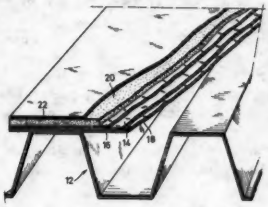
an under layer comprised of a plurality of intermeshed synthetic monofilament spiral strips which are retained in that relationship by pintle means.

4,601,943

FIRE PROOFING WEB WITH VAPOR BARRIER

Bert Haiishofer, Achim-von-Arnim-Strasse 28, D-5300 Bonn 1, and Karl Serwane, D-6902 Sandhausen, both of Fed. Rep. of Germany

PCT No. PCT/DE85/00087, § 371 Date Nov. 4, 1985, § 102(e) Date Nov. 4, 1985, PCT Pub. No. WO85/04209, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 15, 1985, Ser. No. 800,642
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409897
Int. Cl.[4] B32B 15/08, 17/06; E04B 1/94; E04C 2/26
U.S. Cl. 428—246 4 Claims



1. A fire proofing web with vapor barrier for covering roof and wall surfaces and the like comprising a carrier web and a flame proofing web which is applied thereto, comprising a glass fiber fleece with a content of crystalline-bound water, characterized in that the carrier web is an aluminum foil (14), plastic foils (16, 18) are applied to both sides of the aluminum foil (14), and the glass fiber fleece (20) which has a content of crystalline-bound water is applied to one (16) of the plastic foils and is coated with a layer of wax (22) on its free surface.

4,601,944

POLYBUTADIENE-EPOXY-ANHYDRIDE LAMINATING RESINS

Melvin P. Zussman, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 5, 1985, Ser. No. 741,414
Int. Cl.[4] C08G 59/24, 59/42
U.S. Cl. 428—251 23 Claims

1. A composition comprising:

(A) a liquid prepolymer that comprises the reaction product of

(1) a monoanhydride;

(2) a cycloaliphatic epoxy in an amount from about stoichiometric with said monoanhydride to about 20 mole % in excess of stoichiometric; and

(3) about 0.1 to about 1% by weight, based on said monoanhydride weight plus said cycloaliphatic epoxy weight, of an alcohol;

(B) maleated polybutadiene in a weight ratio with said liquid prepolymer of about 2 to 1 to about 1 to 2, said maleated polybutadiene comprising the reaction product of

(1) polybutadiene having a molecular weight of about 1000 to about 5000, and having at least 80% 1,2-unsaturation;

(2) about 0.05 to about 0.2 moles of maleic anhydride per repeating unit of said polybutadiene; and

(3) about 0.01 to about 1.0% by weight, based on said maleated polybutadiene weight, of an oxygen scavenger; and

(C) about 0.1 to about 3% by weight, based on total resin solids, of a tertiary amine accelerator;

(D) about 1 to about 6% by weight, based on total resin solids, of a free radical initiator that has a half life of at least 30 minutes at 135° C.; and

(E) about 30 to about 60% by weight of a solvent, based on total composition weight.

4,601,945

POLYIMIDE MATRIX, FIBER REINFORCED COMPOSITE ARTICLE AND METHOD OF MAKING THE SAME

Roscoe A. Pike, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 28, 1985, Ser. No. 695,784
Int. Cl.[4] B32B *27/34, 27/36, 9/00, 31/00*
U.S. Cl. 428—287 5 Claims

1. A method of making a fiber reinforced, polyimide matrix composite article comprising:

preparing an aqueous solution of a water soluble polyimide precursor matrix material, said solution containing sufficient nonionic surfactant to lower the surface tension of the solution to about 35 dynes/cm or lower,

coating the reinforcing fibers with the matrix solution,

forming the coated fibers into tapes,

removing the excess water from the matrix material, forming a dried tape,

cutting the tapes into predetermined shapes,

stacking these cut shapes to form a preform lay-up,

densifying under sufficient heat and pressure to form the cured polyimide matrix composite article.

2. A composite article of fiber reinforced, polyimide resin matrix resulting from the method of claim 1.

4,601,946

MAGNETIC RECORDING MEDIUM

Shinobu Iida; Nobutaka Yamaguchi; Fumiaki Tsukuda; Masaaki Fujiyama, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 26, 1984, Ser. No. 634,517
Claims priority, application Japan, Jul. 26, 1983, 58-136336
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—323 23 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic recording layer consisting essentially of a ferromagnetic powder and containing graphite, a fatty acid ester and a binder, wherein the graphite is selected from the group consisting of flake shaped graphite, granular graphite or plumbago shaped graphite, the graphite having an average primary particle size of about 0.01 to 3 micron and being present in an amount from about 0.1 to 10 parts by weight per 100 parts by weight of the ferromagnetic powder and the fatty acid ester being an ester of a fatty acid having 6 to 22 carbon atoms and an alcohol having 2 to 27 carbon atoms, the fatty acid ester being present in an amount from about 0.05 to 10 parts by weight per 100 parts by weight of the ferromagnetic powder.

4,601,947

MAGNETIC RECORDING MEDIUM

Shigeru Shimada, Saku; Yuichi Kubota, and Masaharu Nishimatsu, both of Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Oct. 4, 1984, Ser. No. 657,728
Claims priority, application Japan, Oct. 4, 1983, 58-184535
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—336 9 Claims

1. A magnetic recording medium, produced by preparing a resin solution for magnetic paint having as a main component thereof a copolymer of (A) vinyl chloride, (B) a vinyl carboxylate, (C) an unsaturated carboxylic acid, (D) an unsaturated carboxylic anhydride and (E) vinyl alcohol, containing 50 to 90% by weight of (A) based on the total of the amounts of (A), (B) and (E), 1 to 15% by weight of (E) based on the total of the amounts of (A), (B) and (E), 0 to 30% by weight of (D) based on the total of amounts of (C) and (D), and 1 to 5 parts by weight of the total of (C) and (D) based on 100 parts by weight of the total of (A), (B) and (E) and having an average polymerization degree of 100 to 400, mixing 10 to 80% by weight of said resin solution with 90 to 20% by weight of a radiation curable resin, blending the resultant mixture as a main component with a magnetic powder, applying the resultant magnetic paint to a non-magnetic substrate, and curing the applied layer of paint with radiation.

4,601,948

HIGH-FREQUENCY HEATABLE PLASTICS

Gerald M. Lancaster, Freeport, and James A. Allen, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 531,110, Sep. 12, 1983. This application Aug. 31, 1984, Ser. No. 645,990
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—349 15 Claims

1. A composition of matter comprising a terpolymer of ethylene/carbon monoxide/acid where the said acid comprises acrylic acid or methacrylic acid,

wherein the ethylene comprises an amount in the range of 20% to 98% by weight, the carbon monoxide comprises an amount in the range of 1% to 40% by weight, and the acid comprises 1% to 40% by weight of the total weight,

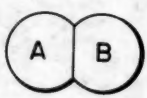
said terpolymer being further characterized as being a substantially uniform, random terpolymer having a melt flow rate, as measured by ASTM D-1238, in the range of about 0.5 to about 2500g/10 minutes.

4,601,949

CONJUGATE FILAMENTS AND PROCESS FOR PRODUCING SAME

Hartwig C. Bach, and William B. Black, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 484,110, Apr. 11, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,241
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—374 18 Claims



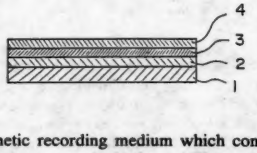
1. A substantially torque-free filament comprising a first longitudinal polyamide segment and a second longitudinal polyamide segment arranged in a side-by-side configuration along the length of the filament and differing from each other in longitudinal dimensional change characteristics, said filament having a high-load crimp test value of at least 12% and a boiling water shrinkage test value such that the quotient obtained by dividing said crimp test value by said shrinkage test value is at least one.

4,601,950

MAGNETIC RECORDING MEDIUM AND MANUFACTURING METHOD THEREOF

Tamaki Iida, Higashikurumei, and Kaname Inoue, Kawasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,449
Claims priority, application Japan, Sep. 10, 1984, 59-189244
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—421 5 Claims



1. A magnetic recording medium which comprises a substrate and layers successively formed thereon comprising a metallic magnetic layer, a plasma-polymerized layer of a silane compound and a fluorinated resin layer.

4,601,951

IMPREGNATION OF LEATHER WITH POLYURETHANE DISPERSIONS

Paul A. Fertell, Wilmington, N.J.; John McCartney, Chester, Pa., and Giandaniele Robbiati, Milan, Italy, assignors to Steon Company, Newark, N.J.

Continuation of Ser. No. 260,042, May 4, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 557,942

Int. Cl.[4] B32B *27/00, 27/04*

U.S. Cl. 428—423.4 24 Claims

17. An impregnated leather composite comprised of a leather sheet having an ionically coagulated aqueously ionically solubilized polyurethane polymer impregnated throughout said leather sheet at a level sufficient to improve the tear strength of said leather, said composite having an internal structure attributable to the complete saturation thereof with an impregnant from which said ionically coagulated aqueously ionically solubilized polyurethane is derived, and said composite having a bulk density less that its actual density.

4,601,952

HIGH DENSITY MOISTURE RESISTANT MICA SHEET

Arthur F. Doyle, Portsmouth, and Dennis J. Sklarski, Deerfield, both of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 627,244, Jul. 2, 1984, abandoned. This application Sep. 16, 1985, Ser. No. 776,109

Int. Cl.[4] B32B *15/02*

U.S. Cl. 428—454 3 Claims

1. A mica composite laminate comprising:

a plurality of papers consisting essentially of mica, each impregnated with about 5% to about 14% by weight of a polysiloxane binder; said binder containing about 1% to about 4% by weight of a titanate and about 0.5% to about 2% by weight of a naphthenate, wherein the composite has a density greater than about 1.5 g/cc and can withstand immersion in boiling water for 1 hour without delaminating.

4,601,953

ROLLING SHUTTER BAR

Dieter Haffer, Pirmasens-Gersbach, Fed. Rep. of Germany, assignor to Gebruder Kommerling Kunststoffwerke GmbH, Pirmasens, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,559

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407640

Int. Cl.[4] E06B *9/10*

U.S. Cl. 428—457 10 Claims

1. A rolling shutter bar comprising a hollow plastic member having a weather-side wall and a building side wall, said walls being spaced from each other to form a hollow therebetween by plastic web members molded thereon and extending therebetween, a first metal layer covering the outer exposed surface of said weather-side wall and adhered to the surface thereof, a second metal layer covering the surface of said building side wall in said hollow between said walls and adhered to the hollow wall surface of said building side wall, said metal layer coverings reinforcing said walls, said webs between said walls having a thickness adequate to transmit longitudinal shear stresses applied to said reinforced walls, at least one of said metal layer coverings having a surface for reflecting thermal radiation and reducing thermal irradiation.

4,601,954

DISINFECTANT FORMULATION

David L. Coleman, Naperville, Ill., assignor to ServiceMaster Industries, Inc., Downers Grove, Ill.

Filed Mar. 30, 1984, Ser. No. 595,441

Int. Cl.[4] G32B *27/30*

U.S. Cl. 428—522 10 Claims

1. A polyvinylchloride tile having a nondiscoloring disinfectant coating on the surface thereof, the composition of said coating comprising an alkyl quaternary ammonium chloride compound and an amino compound taken from the group consisting of urea and guanadine hydrochloride, ratio of said chloride compound to said amino compound ranging from 1:0.6 to 1:2.6.

4,601,955

COMPOSITE MATERIAL FOR DECORATIVE APPLICATIONS

Kazuo Kurahashi, and Nobutoshi Onodera, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jul. 17, 1985, Ser. No. 756,029

Claims priority, application Japan, Jul. 26, 1984, 59-156386

Int. Cl.[4] C22C *1/09*

U.S. Cl. 428—614 3 Claims

1. A composite material for decorative applications comprising a core including whiskers dispersed in a matrix selected from the group consisting of Ti, Ti-base alloys, Al and Al-base alloys, said whiskers present in the range of from 5 to 30% by volume and having an aspect ratio in the range of from 10 to 5000, and a sheath clad to said core and having a cross-sectional surface ratio in the range of from 3 to 30%, said sheath selected from the group consisting of Ni, Ni-base alloys, Cu and Cu-base alloys.

4,601,956

COMPOSITE MATERIAL MADE FROM MATRIX METAL REINFORCED WITH MIXED AMORPHOUS ALUMINA-SILICA FIBERS AND MINERAL FIBERS

Tadashi Dohnomoto, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 16, 1985, Ser. No. 734,655

Claims priority, application Japan, Mar. 1, 1985, 60-040906

Int. Cl.[4] B32B *5/02, 7/00*

U.S. Cl. 428—614 16 Claims

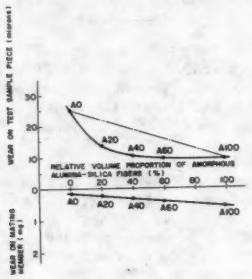
1. A composite material, consisting essentially of:

(a) a reinforcing material which is a hybrid fiber mixture material consisting essentially of:

(a1) an effective amount of a reinforcing amorphous alumina-silica fiber material with the principle components being about 35% to about 80% by weight of Al_2A_3 and about 65% to about 20% by weight of SiO_2, and with a content of other substances of less than or equal to about 10% by weight, with the percentage of non-fibrous particles included therein being less than or equal to about 17% by weight, and with the percentage of non-fibrous particles with diameters greater than about 150 microns included therein being less than or equal to about 7% by weight; and

(a2) an effective amount of a reinforcing mineral fiber material having as the principle components SiO_2, CaO, and Al_2O_3, the content of included MgO therein being

less than or equal to about 10% by weight, the content of included Fe_2O_3 therein being less than or equal to about 5% by weight, and the content of other inorganic substances included therein being less than or equal to about 10% by weight, with the percentage of non-fibrous particles included therein being less than or equal to about 20% by weight, and with the percentage



of non-fibrous particles with diameters greater than about 150 microns included therein being less than or equal to about 7% by weight; and

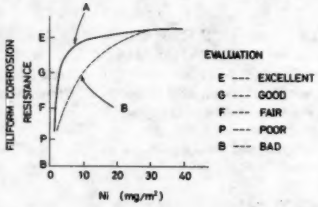
(b) a matrix metal selected from the group consisting of aluminum, magnesium, copper, zinc, lead, tin and alloys having these metals as principle components; wherein the volume of said hybrid fiber mixture material in said composite material is at least 1%.

4,601,957

METHOD FOR PRODUCING A THIN TIN AND NICKEL PLATED STEEL SHEET FOR WELDED CAN MATERIAL

Terunori Fujimoto, Kudamatsu; Yasuhiko Nakagawa, Yamaguchi; Toshio Baba, Hikari; Hirokazu Moriyama, Kudamatsu; Akio Miyachi, Hikari, and Tsuneo Inui, Tokuyama, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,777
Int. Cl.[4] C25D *5/36, 5/50*
U.S. Cl. 428—622 **16 Claims**



1. A method for producing a tin and nickel plated steel sheet having a surface structure in which the distribution of numerous nodules of metallic tin are observed by using an electron microscope (1000 magnifications) on an iron-tin-nickel alloy layer formed on a steel sheet with comprises:

(1) anodically treating a substantially clean steel sheet in an alkaline electrolyte with a pH of above 10,

(2) nickel electroplating the steel sheet treated by step (1),

(3) electrotinplating the steel sheet plated with nickel by step (2),

(4) reflowing and quenching the tin and nickel plated steel sheet by step (3), and

(5) chromate treatment of the tin and nickel plated steel sheet obtained by step (4)

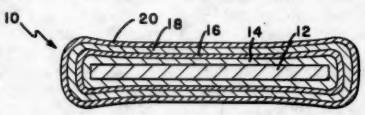
9. The tin and nickel plated steel sheet according to claim (1).

4,601,958

PLATED PARTS AND THEIR PRODUCTION

Samuel W. Levine, Roslyn, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 26, 1984, Ser. No. 655,002
Int. Cl.[4] B32B *15/01*
U.S. Cl. 428—672 **36 Claims**



1. A plated metal part comprising:

a base layer of a metal which is corrodable in a salt atmosphere environment;

a first layer of nickel or a nickel based alloy plated on said base metal;

a first layer of gold or a gold based alloy plated on said first layer of nickel or nickel based alloy;

a second layer of nickel or a nickel based alloy plated on said first layer of gold or gold based alloy; and

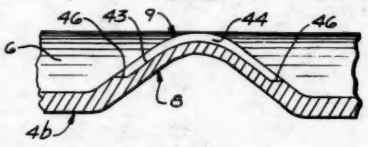
a second layer of gold or gold based alloy plated on said second layer of nickel or nickel based alloy; whereby said plated part has enhanced electrolytic corrosion resistance when subjected to the salt spray corrosion test of Mil-Std-883C Method 1009.4 Test Condition A, as compared with a plated part having a single layer of gold of substantially the same thickness as the sum of the thicknesses of the gold layers in said plated metal part.

4,601,959

VENT CONSTRUCTION FOR BATTERIES

Antonio Romero, Parkton, Md., assignor to Saft America, Inc., Valdosta, Ga.

Filed Apr. 17, 1984, Ser. No. 601,237
Int. Cl.[4] H01M *2/12*
U.S. Cl. 429—56 **17 Claims**



1. In a battery casing to be hermetically sealed, said casing having main side walls with end walls bridging the end portions of said side walls, at least one of said end walls facing and being exposed to the battery interior, the improvement in vent means for the casing which ruptures when internal casing pressure exceeds a given value, said vent means including at least one vent-forming rib of a given length and width projecting outward from a portion of said end wall normally facing the battery interior, said rib being in a central band or segment of said one end wall and oriented so that the length of the rib is parallel to said band or segment; and said rib having formed therein a vent-forming groove which extends transversely of the length of the rib only part way substantially symmetrically along the transverse contour thereof, so that both ends of the groove are spaced from the base of the rib and the groove extends comparable distances on both sides of the top or center point of the rib contour.

4,601,960
PHOTOELECTROCHEMICAL SOLAR CELL AND METHOD OF FABRICATING A SUBSTRATE FOR SUCH A CELL

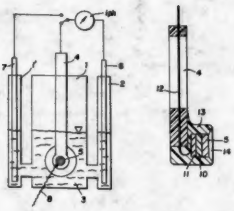
Shalini Menezes, Califon, N.J.; Hans-Joachim Lewerenz, Berlin, Fed. Rep. of Germany, and Klaus Bachmann, Raleigh, N.C., assignors to Hahn-Meitner-Institut für Kernforschung Berlin GmbH, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 637,758

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330902; Dec. 22, 1983, 3347129

Int. Cl.⁴ H01M *6/36*

U.S. Cl. 429—111 **16 Claims**



1. A photoelectrochemical solar cell having an efficiency of about 10% for converting light energy into electric energy, comprising:

a container;

a liquid electrolyte in said container comprising an iodine-iodide solution, plus at least some Cu^{+}ions; and

a working electrode in said container and in contact with said electrolyte, said working electrode comprising a semiconductor ternary semiconductor compound selected from one of the material systems of $CuInSe_2$ and $CuInS_2$, inclusive of in situ produced surface modifications thereof.

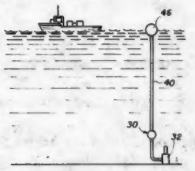
4,601,961
BILAMINAR SEAWATER BATTERY

Joseph F. McCartney, Virginia Beach, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1985, Ser. No. 795,032

Int. Cl.⁴ H01M *6/34*

U.S. Cl. 429—119 **17 Claims**



1. A bilaminar seawater battery comprising:

an anode including a flexible sheet of anode material;

a cathode including a flexible foil of cathode material;

an insulative flexible film joining one side of the cathode foil to one side of the anode sheet so as to form a flexible bilaminar composite;

the bilaminar composite having top and bottom edges;

means operatively associated with the bilaminar composite for providing positive buoyancy to the bilaminar composite in seawater;

ballast means connected to the bottom edge of the bilaminar composite;

an electrical lead connected to the anode sheet and an electrical lead connected to the cathode foil at a common edge of the bilaminar composite and in close proximity to one another;

the bilaminar composite being flexed to a compacted condition; and

means releasably retaining the bilaminar composite in the compacted flexed condition;

whereby upon placing the battery in seawater and releasing the retaining means the bilaminar composite will unflex and electrical current will be produced across the electrical leads.

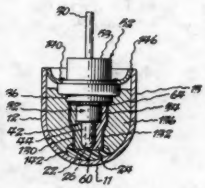
4,601,962
ANODE ASSEMBLY FOR LITHIUM-HALOGEN CELL

Robert A. Zayatz, North Tonawanda, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.

Division of Ser. No. 368,865, Apr. 15, 1982, Pat. No. 4,421,833, which is a division of Ser. No. 222,498, Jan. 5, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,437

Int. Cl.⁴ H01M *4/02*

U.S. Cl. 429—211 **7 Claims**



1. An anode assembly for a lithium-halogen cell including halogen-containing cathode material, said anode assembly comprising an anode electrical conductor sandwiched between a pair of lithium plates defining substantially oppositely-directed lithiumsurfaces terminating in a peripheral edge, at least a major portion of the length of said peripheral edge being uncovered and exposed, at least one of said oppositely-directed lithium surfaces being shaped to include formations which increase the surface area thereof, said formations terminating a short distance inwardly of said peripheral edge thereby defining a marginal bonded border region between said peripheral edge and said formations.

4,601,963
LOCALLY DEFORMABLE PHOTOSENSITIVE DRUM FOR USE IN ELECTROPHOTOGRAPHY

Michio Takahashi; Mitsuo Tanaka, both of Machida; Fuchio Kanno, Yokohama, and Kazuo Kobayashi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Apr. 16, 1984, Ser. No. 600,894

Claims priority, application Japan, Apr. 15, 1983, 58-65644; Apr. 15, 1983, 58-65645; Apr. 15, 1983, 58-65646

Int. Cl.⁴ G03G *5/10*

U.S. Cl. 430—69 **20 Claims**

1. A cylindrical photosensitive drum for use in electrophotography comprising:

a cylindrical core comprised of an elastic material supported on a rigid shaft; and

an outer cylindrical layer provided as integrally fitted onto an outer peripheral surface of said core, said outer layer being concentric with said drum and including a supporting layer and a photosensitive layer formed on said supporting layer, whereby said outer layer and said core, when combined, are structured such that said drum, when rotating about said rigid shaft deforms locally only at a point where an external force is applied and its immediate vicinity while maintaining the other portions virtually unchanged.

4,601,964

PHOTOCONDUCTIVE MEMBER COMPRISING LAYER OF A-SI/A-SI(GE)/A-SI(O)

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,700

Claims priority, application Japan, Dec. 29, 1983, 58-250271; Dec. 31, 1983, 58-246736; Jan. 4, 1984, 59-174

Int. Cl.[4] G03G 5/085

U.S. Cl. 430—84 **57 Claims**

1. A light-receiving member comprising a substrate for light-receiving member and a light-receiving layer having photoconductivity provided on said substrate, said light-receiving layer comprising from the side of said substrate a first layer (I) comprising an amorphous material containing silicon atoms, a second layer (II) comprising an amorphous material containing silicon atoms and germanium atoms and wherein at least one of hydrogen or halogen atoms are contained in at least one of the first layer (I) or the second layer (II), and a third layer (III) comprising an amorphous material containing silicon atoms and oxygen atoms, and the germanium atoms contained in said second layer (II) being distributed ununiformly in the layer thickness direction of said layer.

4,601,965

PHOTOSENSITIVE MATERIAL FOR USE IN ELECTROPHOTOGRAPHY

Yukio Ide, Mishima, and Selichi Ohseto, Numazu, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 458,093

Claims priority, application Japan, Jan. 19, 1982, 57-6230

Int. Cl.[4] G03G 5/082

U.S. Cl. 430—85 **3 Claims**

1. A photosensitive material for use in electrophotography, which comprises a Se-As photosensitive layer containing from 20 to 40% by weight of As, said photosensitive layer having incorporated therein from 1 to 500 ppm of As oxide.

4,601,966

DRY, ELECTROGRAPHIC DEVELOPER COMPOSITIONS CONTAINING POLYESTER-AMIDE TONER PARTICLES

Hans R. Grashof, Rochester; Hsin-Chia Kan, Fairport; M. Akram Sandhu, Pittsford; John F. Wright, Penfield, and Paul D. Yacobucci, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1985, Ser. No. 688,386

Int. Cl.[4] G03G 9/08

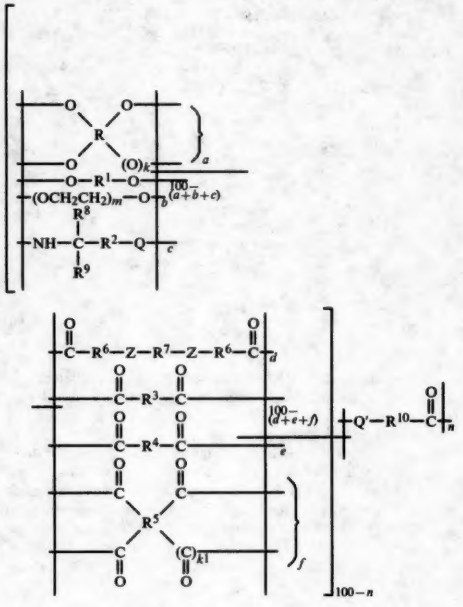
U.S. Cl. 430—109 **6 Claims**

1. A two-component dry electrographic developer composition comprising a plurality of charged carrier particles and a plurality of oppositely charged toner particles, said toner particles comprising, as a binder, a random and amorphous polyesteramide having amide linkages in the polymer backbone and derived from at least 20 mole percent of an aromatic dicarboxylic acid, based on the total carboxylic acid-derived units, and either:

(i) a polyfunctional compound containing a primary amino group and a hydroxy group or

(ii) a polyfunctional compound containing at least two primary amino groups and a polyfunctional compound containing at least two hydroxy groups,

wherein the polyester-amide random copolymer is of the general formula:



wherein:

each of Q and Q′ independently is —O— or —NH—;

Z is —CONH— or —NHCO— wherein N is not directly attached to an aromatic ring;

R is a tri- or tetravalent residue of an alkane or cycloalkane,

R^1 and R^3, independently, are straight-chain, branced or cyclized alkylene;

R^2 and R^{10}, independently, are alkylene, cycloalkylene, a divalent aromatic group, or alkylene-(1-Q″-alkylene)$_x$ where Q″ is —O— or —NH— and x is 1 to 4, R^2 and R^{10} being such that, when Q or Q′ is —NH—, the nitrogen atom is not bonded directly to an aromatic ring;

R^4 is an arylene group;

R^5 is a tri or tetravalent residue of an alkane, cycloalkane or aromatic compound;

R^6 and R^7, independently, are arylene or alkylene;

R^8 and R^9, independently, are hydrogen, alkyl or —R^{11}—Q— wherein R^{11} alkylene;

a is 0 to 5 mole percent;

b is 0 to 80 mole percent;

c is 0 to 100 mole percent;

d is 0 to 100 mole percent;

e is 20 to 100 mole percent;

f is 0 to 5 mole percent;

k and k^1, independently, are 0 or 1;

m is 2, 3 or 4;

n is 0 to 70 mole percent;

with the proviso that c and d are not both 0, and the mole percentages of a to f, and n are chosen so that 1 to about 50 percent of the total number of ester and amide linkages are amide linkages.

4,601,967

TONER PARTICLES HAVING A RELATIVELY HIGH SPECIFIC VOLUME RESISTIVITY COATING LAYER

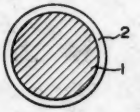
Akira Suzuki, Mishima; Kazuo Kobayashi, and Sigekazu Enoki, both of Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 679,054

Claims priority, application Japan, Dec. 10, 1983, 58-232249; Dec. 10, 1983, 58-232250

Int. Cl.[4] G03G *9/00, 9/10, 9/14;* G03C *1/72*

U.S. Cl. 430—107 18 Claims



1. A toner for developing latent electrostatic images comprising toner particles, each toner particle comprising a core particle having a specific volume resistivity ranging from 10^2 ohm-cm to 10^9 ohm-cm and a coating layer with which the surface of said core particle is coated, having a specific volume resistivity of 10^9 ohm-cm or more, said core particle comprising an electroconductive material and a binder agent, and said coating layer comprising a binder agent and a component selected from the group consisting of a magnetic material and a coloring agent.

4,601,968

PROCESS FOR PRODUCING TONER FOR DEVELOPMENT OF ELECTROSTATIC IMAGES BY STEPWISE SUSPENSION POLYMERIZATIONS

Yoshihiko Hyosu, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,333

Claims priority, application Japan, Oct. 4, 1982, 57-174218; Oct. 4, 1982, 57-174219

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—137 11 Claims

1. A process for producing a toner for developing electrostatically charged images, which comprises the steps of:

a. dispersing a polymerizable mixture comprising a polymerizable monomer, a polymerization initiator and a colorant in a dispersion medium in which the polymerizable monomer is substantially insoluble, under sufficient high shearing force as to produce dispersion droplets of the polymerizable mixture in sizes of 4 to 27μ wherein up to about 0.1 wt. % of surfactant based on the polymerizable mixture is present to promote the dispersion medium;

b. polymerizing the dispersion of the polymerizable mixture in the dispersion medium to produce polymer particles in a weight average particle size in the range from 4 to 27μ;

c. adding 5 to 100 parts by weight of an additional polymerizable monomer per 100 parts by weight of the polymerizable monomer in step a. and an oil-soluble polymerization initiator dissolved in the additional polymerizable monomer into the disperse system containing the polymeric particles formed, to have the monomer adsorbed on the polymeric particles; and

d. polymerizing the additional polymerizable monomer thereby to obtain polymer particles as a toner having a weight averge particle size in the range of from 5 to 30μ.

4,601,969

HIGH CONTRAST, HIGH RESOLUTION DEEP ULTRAVIOLET LITHOGRAPHIC RESIST COMPOSITION WITH DIAZO CARBONYL COMPOUND HAVING ALPHA PHOSPHORYL SUBSTITUTION

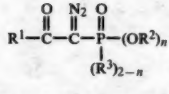
Nicholas J. Clecak, San Jose, Calif.; Barbara D. Grant, Ossining, N.Y.; Robert D. Miller, San Jose, Calif.; Terry C. Tompkins, Los Altos, Calif., and Carlton G. Willson, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1985, Ser. No. 717,254

Int. Cl.[4] G03C *1/54*

U.S. Cl. 430—192 10 Claims

1. A lithographic resist composition for use with ultraviolet light of less than 313 nm wavelength, said composition comprising a sufficient quantity of a weakly acidic resin and admixed therewith a sufficient quantity of a sensitizer which is an alpha phosphoryl substituted diazo carbonyl compound having the formula



where each of R^1, R^2 and R^3 independently is alkyl or aryl, and n is 0, 1 or 2 the sufficient quantity amounts of the resin and the sensitizer enable ultra-violet exposed portions of the composition to become sufficiently soluble in an alkaline developer to permit formation of a resist image.

4,601,970

DRY PHOTOSENSITIVE FILM CONTAINING CROSSLINKED BEADS

Abraham B. Cohen, Springfield, N.J., and Vincent J. Webers, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 611,870, May 18, 1984, Pat. No. 4,551,415, which is a continuation-in-part of Ser. No. 370,991, Apr. 22, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 756,698

Int. Cl.[4] G03C *11/12*

U.S. Cl. 430—258 12 Claims

1. A dry photosensitive film having an elongation at break above about 200% consisting essentially of a solventless photosensitive composition of

(a) 5 to 45% by weight based on the weight of components (a) to (d) of at least one nongaseous, ethylenically unsaturated compound having at least one terminal ethylenic group, said compound being capable of forming a high polymer by free-radical initiated, chain-propagating addition polymerization;

(b) 0.05 to 10% by weight based on the weight of components (a) to (d) of an organic, radiation-sensitive, free-radical generating system, activatable by actinic radiation which initiates polymerization of the unsaturated compound;

(c) at least one organic polymeric binder; and

(d) discrete, substantially nonswellable crosslinked polymeric beads having an average diameter in the range of 0.02 to 4.0 μm, wherein at least 90% of the beads by population are below 6 μm, the beads being insoluble and nonagglomerating in a solvent for the organic polymeric binder component, said crosslinked polymeric beads are taken from the class consisting of homopolymers and copolymers of tri-, and tetraacrylate, and tri-, and tetramethacrylate monomers which contain three or more free-radical polymerizable double bonds per molecule, copolymers of at least one of said acrylate and methacrylate monomers and up to 25% by weight of at least one monomer having one terminal ethylenic group, and copolymers of at least one of said acrylate and methacrylate monomers

and up to 75% by weight of at least one monomer having two terminal ethylenic groups, the total weight percent of the combination of components (c) and (d) based on the total weight of components (a) to (d) being 40 to 70% by weight, component (d) being present in an amount of 15 to 90% by weight based on the weight of components (c) and (d).

4,601,971

TUNNEL CATHODE MASK FOR ELECTRON LITHOGRAPHY AND METHOD FOR MANUFACTURING AND OPERATING IT

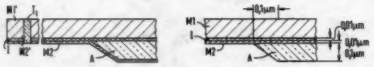
Burkhard Lischke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,710

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235064

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—296 **12 Claims**



1. In a mask for electron projection corpuscular lithography, the improvement comprising providing the mask as a tunnel cathode having a sandwich structure with an insulating region through which electrons tunnel in corpuscle-emitting regions and non-corpuscle emitting regions of the mask, and an absorber means being provided at the non-corpuscle emitting regions for absorbing electrons.

9. A method for manufacturing a mask for electron projection corpuscular lithography, comprising the steps of:

forming a tunnel cathode by providing a first metal layer, an insulating layer on a surface of the first metal layer, absorber regions at portions of the mask at which electron emission is not to occur, and a second metal layer overlying the insulating layer and between the absorber regions and the first metal layer, said second metal layer being sufficiently thin and the insulator being sufficiently thin so as to permit tunnel cathode electron emission from the first metal through the insulator and through the second metal onto a surface to be lithographed, the absorber regions being sufficiently thick to absorb emitted electrons; and

forming said absorber regions after application of the second metal layer by radiating regions at which it is desired to form the absorber regions so that absorber regions are grown thereat due to contamination with carbon in a vacuum in which the absorber regions are being grown.

4,601,972

PHOTODEFINABLE TRIAZINE BASED COMPOSITION

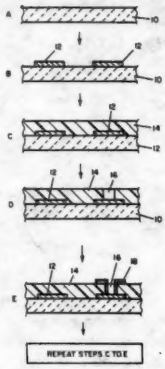
Richard D. Small, Jr., Lawrence Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 597,626, Apr. 6, 1984, Pat. No. 4,554,229. This application Jul. 26, 1985, Ser. No. 759,212

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—280 **7 Claims**

1. A photodefinable dielectric material comprising a triazine mixture which mixture comprises 50–60 weight percent triazine, at least one member of the group consisting of an epoxy acrylate hybrid resin and an acrylated rubber resin in an amount totalling 20–30 weight percent, 5–12 weight percent of a hardener, 2–6 weight percent of a crosslinking agent, 2–5



weight percent of a coupling agent and ½–3 weight percent of a photoinitiator.

4,601,973

PHOTOPOLYMERIZABLE COATING AGENT, A PHOTOPOLYMERIZABLE MATERIAL AND ITS USE

Sigrid Bauer, Paudex, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 503,445, Jun. 13, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,713

Claims priority, application Switzerland, Jun. 24, 1982, 3885/82

Int. Cl.[4] G03C *1/68*; C08F *8/00*

U.S. Cl. 430—280 **10 Claims**

1. A photopolymerizable coating agent which comprises

(a) at least one uncured epoxy resin based on a bisphenol or a novolac and epichlorohydrin, and having an epoxide value of 0.2 to 0.5 equivalents per kg of resin and an average molecular weight of 1,000 to 10,000,

(b) at least one uncured epoxy resin based on a bisphenol or a novolac and epichlorohydrin, and having an average molecular weight of 20,000 to 60,000, the weight ratio of a:b being from 9:1 to 3:1,

(c) at least one light-sensitive, polyethylenically unsaturated monomer having terminal ethylene groups, and

(d) at least one photoinitiator or at least one sensitizer or a mixture of at least one photoinitiator and at least one sensitizer.

4,601,974

DESENSITIZING GUM FOR LITHOGRAPHIC PRINTING

Nobuyuki Kita; Hiroshi Matsumoto, and Masanori Imai, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 531,796, Sep. 13, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,940

Claims priority, application Japan, Sep. 13, 1982, 57-159284

Int. Cl.[4] G03F *7/00*; B41N *3/00*

U.S. Cl. 430—309 **9 Claims**

1. A gumming process for a lithographic printing plate, comprising applying a desensitizing gum to an exposed and developed presensitized lithographic printing plate, spreading the desensitizing gum all over the plate surface, wiping off excess desensitizing gum and drying, the desensitizing gum comprising water having dissolved therein 5 to 35 wt %, based on the total weight of the desensitizing gum, of at least one of a film-forming, water-soluble compound selected from the

group consisting of (A) enzyme-decomposed dextrin prepared by decomposing a starch selected from the group consisting of potato starch, sweet potato starch, wheat starch, corn starch, tapioca starch and rice starch using an enzyme selected from the group consisting of α-amylase, β amylase and saccharogenic amylase and (B) enzyme-decomposed etherified dextrin prepared by decomposing hydroxyethyl starch, hydroxypropyl starch and ethyl starch using an enzyme selected from the group consisting of α-amylase, β-amylase and saccharogenic amylase; wherein said enzyme-decomposed dextrin or said enzyme-decomposed etherified dextrin is prepared by decomposition to the degree that said enzyme-decomposed dextrin or said enzyme-decomposed etherified dextrin contains 10 to 40 wt % of reducing sugar.

4,601,975

METHOD FOR PROCESSING LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shigeharu Koboshi; Kazuhiro Kobayashi; Masao Ishikawa; Masahiko Kon, and Satoru Kuse, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 683,931

Claims priority, application Japan, Dec. 23, 1983, 58-242140; Jan. 26, 1984, 59-13168

Int. Cl.[4] G03C *7/00, 5/38*

U.S. Cl. 430—393 **14 Claims**

1. A method for processing a light-sensitive silver halide color photographic material comprising developing a light-sensitive silver halide color photographic material after image-wise exposure with a color developing solution containing a p-phenylenediamine type color developing agent containing at least one water-soluble group on its amino group and then subjecting the developed material to direct processing with a bleach-fixing solution maintained in a state of being air oxidized, said bleach-fixing solution containing a diethylenetriaminepentaacetic acid iron (III) complex as the bleaching agent for said bleach-fixing processing.

4,601,976

MULTILAYER COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yukio Karino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 15, 1985, Ser. No. 765,986

Claims priority, application Japan, Aug. 16, 1984, 59-170591

Int. Cl.[4] G03C *1/40, 5/54, 1/80, 1/96*

U.S. Cl. 430—496 **20 Claims**

1. A multilayer color photographic light-sensitive material containing no image-receiving layer, which comprises a support, an internal latent image type direct reversal silver halide emulsion layer combined with a dye-providing substance, and a void layer between the support and the layer containing the dye-providing substance closest to the support.

4,601,977

METHOD FOR MEASURING THE ACTIVITY OF PLASMA FACTOR XIII

Kazuo Ogawa; Setsuko Baba, both of Chiba, and Kazuo Nakanishi, Yokohama, all of Japan, assignors to Iatron Laboratories, Inc., Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,473

Claims priority, application Japan, Jun. 11, 1982, 57-99284

Int. Cl.[4] C12Q *1/56*

U.S. Cl. 435—13 **2 Claims**

1. A method for determining blood coagulation factor XIII in plasma by measuring the activity of its activated form XIIIa by using casein and a fluorescent cadaverine derivative as the substrate, characterized by use of polyvinyl alcohol as a column gel for molecular sieves for separating a cadaverine derivative reacted with casein and a cadaverine derivative not reacted with case.

4,601,978

MAMMALIAN METALLOTHIONEIN PROMOTER SYSTEM

Michael Karin, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 24, 1982, Ser. No. 444,134

Int. Cl.[4] C12N *1/20, 5/00, 5/02, 1/00, 15/00;* **C12P** *21/00, 21/02, 19/34;* **C07H** *21/04*

U.S. Cl. 435—68 **16 Claims**

1. A DNA sequence of less than 500 base pairs, said DNA sequence comprising the human MT-II transcriptional regulatory system further comprising the transcription initiation sequence.

4,601,979

PROCESS FOR PREPARING HUMAN INSULIN OR B-30 ESTERS THEREOF

Finn H. Andresen, Hillerød; Per Balschmidt, Espergærde; Kim R. Hejnæs, and Hans Kofod, both of Lyngby, all of Denmark, assignors to Nordisk Insulinlaboratorium, Gentofte, Denmark

PCT No. PCT/DK82/00082, § 371 Date Apr. 11, 1983, § 102(e) Date Apr. 11, 1983, PCT Pub. No. WO83/01074, PCT Pub. Date Mar. 31, 1983

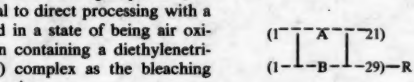
PCT Filed Sep. 14, 1982, Ser. No. 491,325

Claims priority, application Denmark, Sep. 15, 1981, 2545/82; Sep. 15, 1981, 2546/82

Int. Cl.[4] C12P *21/00, 21/06, 21/02*

U.S. Cl. 435—70 **17 Claims**

1. A process for the preparation of a B-30 ester of human insulin by reacting a carboxyl protected L-threonine derivative with an insulin derivative of the formula



(I)

wherein R is hydroxyl or an amino acid radical being different from threonine, and —A— and —B— represent the A- and B-chains with the same amino acid sequence as in human insulin, in the presence of a proteolytic enzyme, capable of splitting lysine carbonyl peptide bonds, in an aqueous reaction medium substantially free of organic cosolvent, at a pH value of from 5 to 9 and at a temperature below 50° C., and for a time sufficient to accumulate the human insulin ester, wherein the L-threonine derivative is used in the reaction mixture in a concentration of from 2 to about 6 moles/liter.

4,601,980

MICROBIAL EXPRESSION OF A GENE FOR HUMAN GROWTH HORMONE

David V. Goeddel, and Herbert L. Heyneker, both of Burlingame, Calif., assignors to Genentech Inc., South San Francisco, Calif.

Division of Ser. No. 55,126, Jul. 5, 1979. This application Mar. 9, 1982, Ser. No. 356,564

Int. Cl.[4] C12P *21/02;* **C12N** *15/00*

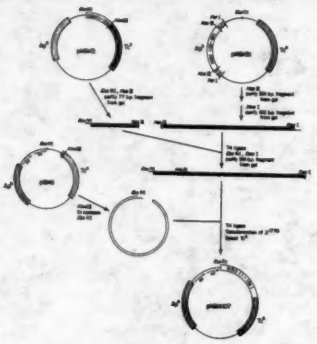
U.S. Cl. 435—70 **3 Claims**

1. A method of producing human growth hormone which comprises:

(a) disposing a culture of bacterial transformants comprising plasmids which, in a transformant bacterium, will express a gene for human growth hormone unaccompanied by the leader sequence of human growth hormone or other extraneous protein bound thereto within a fermenter vessel comprising aeration and agitation means in an aqueous, nutriment-containing fermentation broth;

(b) growing up the culture under aeration and agitation while supplying additional nutriments as required to maintain vigorous growth;

(c) separating the resulting cellular mass from the fermentation broth;
(d) lysing the cells to free the contents thereof;



(e) separating cellular debris from supernatant; and
(f) isolating and purifying human growth hormone contained in the supernatant.

4,601,981

ENZYMATICALLY ACTIVE PROTEIN-ENZYME COMPLEX MEMBRANES

Wolf R. Vieth, Belle Mead; Shaw S. Wang, N. Brunswick, and Seymour G. Gilbert, Piscataway, all of N.J., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 656,384, Feb. 9, 1976, abandoned, which is a continuation of Ser. No. 439,110, Feb. 4, 1974, Pat. No. 3,977,941, which is a division of Ser. No. 135,753, Apr. 20, 1971, Pat. No. 3,843,446. This application Feb. 14, 1980, Ser. No. 121,478

The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.[4] C12P *1/00, 19/24, 19/14;* **C12N** *11/00*

U.S. Cl. 435—94 **6 Claims**

1. A process for hydrolyzing starch which comprises passing a starch solution over an enzymatically active membrane at a temperature and pH suitable for hydrolysis, said membrane comprising amylase complexed with protein or polypeptide, in the form of a membrane, said protein being selected from the group consisting of collagen, zein, casein, ovalbumin, wheat gluten, fibrinogen, myosin, and mucoprotein, or a polypeptide being selected from the group consisting of polyglutamate, polyaspartate, polyphenylalanine, polytyrosine and copolymers of leucine and p-aminophenylalanine characterized in that said membrane retains sufficient enzyme activity to effect enzymatically catalyzed reactions when an enzymatically treatable substrate will be contacted with said membrane, wherein the complexing bonds between said enzyme and said protein or polypeptide are van der Waals interactions, hydrogen bonding and salt linkages.

4,601,982

METHOD FOR PRODUCING L-TRYPTOPHAN BY FERMENTATION WITH A *BREVIBACTERIUM FLAVUM* MUTANT

Isamu Shiio, Kamakura; Shinichi Sugimoto, and Kazue Kawamura, both of Kawasaki, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,334

Claims priority, application Japan, Apr. 20, 1981, 56-59570

Int. Cl.[4] C12P *13/22;* **C12N** *15/00;* **C12R** *1/13*

U.S. Cl. 435—108 **1 Claim**

1. A method for producing L-tryptophan by fermentation, which comprises:

culturing aerobically in a culture medium *Brevibacterium flavum* FERM BP 114, which is resistant to azaserine and tryptophan analogue and capable of producing L-tryptophan; and recovering the L-tryptophan which accumulates in the culture medium.

4,601,983

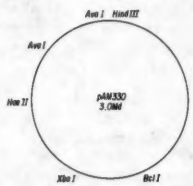
CORYNEFORM BACTERIA CARRYING RECOMBINANT PLASMIDS AND THEIR USE IN THE FERMENTATIVE PRODUCTION OF L-THREONINE AND L-ISOLEUCINE

Shigeru Nakamori, Yokohama; Masaaki Ishida; Hiroshi Takagi, both of Kawasaki; Kiyoshi Miwa, Matsudo; Koichi Ito, Kawasaki, and Konosuke Sano, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,471

Int. Cl.[4] C12P *13/08, 13/06;* **C12N** *15/00;* **C12R** *1/125*

U.S. Cl. 435—115 **2 Claims**



1. A method of producing L-isoleucine by fermentation which comprises:

(a) culturing in an appropriate medium a bacterium comprising a Coryneform host containing a vehicle capable of replication in a Coryneform bacterium containing genetic information coding for the production of a protein having the activity of homoserine dehydrogenase, wherein said host is resistant to α-amino-β-hydroxyvaleric acid, and

(b) recovering L-isoleucine from said medium; and wherein said Coryneform bacterium is selected from the group consisting of those having the identifying characteristics of FERM BP-270 and FERM BP-271.

4,601,984

PROCESS TO PRODUCE ANTIBIOTICS X-14873 A, G AND H

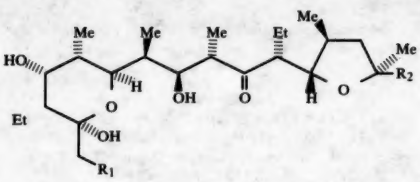
Chao-Min Liu, Cedar Grove, N.J.; Homer D. Tresner, La Farge, Wis., and John Westley, Cedar Grove, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 356,654, Mar. 10, 1982, Pat. No. 4,410,712. This application Jun. 30, 1983, Ser. No. 509,472

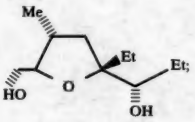
Int. Cl.[4] C12P *17/16*

U.S. Cl. 435—119 **1 Claim**

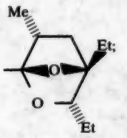
1. A process to produce Antibiotics X-14873 A, G and H of the formula



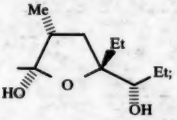
wherein
for X-14873 A, R_1 is CO_2H and R_2 is



for X-14873 G, R_1 is hydrogen and R_2 is



and for X-14873 H, R_1 is hydrogen and R_2 is



which comprises cultivating a strain of Streptomyces sp. X-14873 designated ATCC31679 in an aqueous carbohydrate solution containing a nitrogenous nutrient under submerged aerobic conditions and thereafter isolating the antibiotics from said solution.

4,601,985

MICROORGANISM BELONGING TO *STREPTOCOCCUS THERMOPHILUS* AND A COMPOSITION CONTAINING SAID MICROORGANISM

Shigeo Okonogi, Tokyo; Jyoji Ono, Chiba; Tsutomu Kudo, Yokohama; Akinori Hiramatsu, Hachioji; Susumu Teraguchi, Tama, and Tomoko Yaeshima, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,825
Claims priority, application Japan, Nov. 9, 1982, 57-195375
Int. Cl.[4] C12N *1/20*
U.S. Cl. 435—253 **3 Claims**

1. A biologically pure microorganism belonging to *Streptococcus thermophilus* selected from the group consisting of *Streptococcus thermophilus* M-8202 (FERM BP-351), M-8203 (FERM BP-352), M-3204 (FERM 353), and M-8205 (FERM BP-354) and mixtures thereof which have an oxygen uptake ability of at least 30 nano moles per milligram of dried cells of said microorganism per minute which is defined by the quantity of oxygen consumption as determined by Warbur's manometric method.

2. A microbial composition which comprises as a main ingredient a biologically pure viable cell mass of (a) *Streptococcus termophilus* selected from the group consisting of *Streptococcus thermophilus* M-8202 (FERM BP-351), M-8203 (FERM BP-352), M-8204 (FERM BP-353), and M-8205 (FERM BP-354) and mixtures thereof which have an oxygen uptake ability of at least 30 nano moles per milligram of dried cells of said microorganism per minute which is defined by the quantity of oxygen consumption as determined by Warbur's manometric method and (b) bifidobacteria.

4,601,986

PROTEIN PRODUCT OF REDUCED NUCLEIC ACID CONTENT AND LOW ALLERGENICITY

Eugene H. Wegner, and Lucas K. Shay, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 29, 1983, Ser. No. 518,778
Int. Cl.[4] C12N *1/16;* A23L *1/28*
U.S. Cl. 435—255 **14 Claims**

1. A process to produce microbial cellular derived protein product which comprises the steps:

(1) growing single cell microorganisms on ultra-low sulfur medium wherein said medium contains less than about 0.44 grams sulfur per liter of aqueous ferment, under aerobic aqueous fermentation conditions employing a carbon energy substrate;

(2) creaming the resulting single cells in admixture with sufficient water to form a cream containing about 10 to 25 weight percent cells;

(3) base-treating the said cream employing sufficient base to produce a pH of about 7 to 10, at a temperature of about 65° C. to 99° C., for a time of about 15 to 120 minutes;

(4) thereafter acid-treating the base-treated cells as said cream employing sufficient acid to produce a pH of about 3 to 4.5, at a temperature of about 75° C. to 95° C., for a time of about 15 to 120 minutes;

(5) heat-shocking the base-treated acid-treated cells as said cream at a temperature of about 100° C. to 150° C. for a time of about 30 to 120 seconds;

(6) reducing the water content of said cream to about 15 to 40 weight percent, thereby forming a paste of said base-treated acid-treated cells; and

(7) extruding the base-treated acid-treated heat-shocked cells as said paste at a temperature of about 65° C. to 205° C., under a pressure of about 10 to 100 psig;

thereby producing an extruded microbial cellular derived protein product exhibiting low nucleic acid content and low alergens content toward human consumption.

4,601,987

ENZYMATIC PRODUCTION OF OPTICAL ISOMERS OF 2-HALOPROPIONIC ACIDS

Alexander M. Klibanov, Boston, and Gerald Kirchner, Hyde Park, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

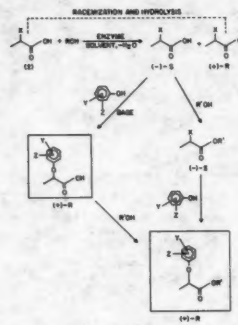
Filed Feb. 27, 1985, Ser. No. 706,039
Int. Cl.[4] C07P *41/00;* C12P *7/40, 7/52*
U.S. Cl. 435—280 **17 Claims**

17. A method of producing optically pure esters of (+)-R-2-phenoxypropionic acids, comprising the steps of:

(a) forming a reaction mixture of a racemic 2-halopropionic acid, an alcohol and a stereospecific lipase in an organic medium under conditions whereby the lipase preferentially catalyzes the esterification of (+)-R-2-halopropionic acids;

(b) separating the unesterified (−)-S-2-halopropionic acid from the ester of (+)-R-2halopropionic acid;

(c) esterifying the (−)-S-2-halopropionic acid to obtain an ester; and



(d) reacting the ester of (−)-S-2-halopropionic acid with a phenol under basic conditions to form an ester of (+)-R-2-phenoxypropionic acid.

4,601,988

DIELECTRIC CERAMIC COMPOSITION

Yukio Sakabe, Funai; Goro Nishioka, Takatsuki, and Junichi Imanari, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 25, 1985, Ser. No. 801,482
Claims priority, application Japan, Nov. 27, 1984, 59-250796
Int. Cl.⁴ C04B *35/46*
U.S. Cl. 501—134 **3 Claims**

1. A dielectric ceramic composition consisting essentially of $Pb(Ni_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$, $PbTiO_3$, $Pb(Zn_{\frac{1}{2}}W_{\frac{1}{2}})O_3$ and $Pb(Cu_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$, the mole percentages of said four components being as follows:

$Pb(Ni_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$—50.0 to 75.0 mole %
$PbTiO_3$—20.0 to 35.0 mole %
$Pb(Zn_{\frac{1}{2}}W_{\frac{1}{2}})O_3$—0.5 to 15.0 mole %
$Pb(Cu_{\frac{1}{3}}Nb_{2\frac{2}{3}})O_3$—1.0 to 10.0 mole %

4,601,989

DIELECTRIC CERAMIC COMPOSITION

Yukio Sakabe, Kyoto; Goro Nishioka, Takatsuki, and Junichi Imanari, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 25, 1985, Ser. No. 801,483
Claims priority, application Japan, Nov. 27, 1984, 59-250798
Int. Cl.⁴ C04B *35/46*
U.S. Cl. 501—136 **3 Claims**

1. A dielectric ceramic composition consisting essentially of $Pb(Ni_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$, $PbTiO_3$, $Pb(Zn_{\frac{1}{2}}W_{\frac{1}{2}})O_3$ and $M(Cu_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$ (wherein M represents at least one element selected from the group consisting of Ba, Sr and Ca), the mole percentages of said four components being as follows:

$Pb(Ni_{1/3}Nb_{2/3})O_3$	45 to 75 mole %
$PbTiO_3$	20 to 40 mole %
$Pb(Zn_{1/2}W_{1/2})O_3$	0.5 to 15 mole %
$M(Cu_{1/3}Nb_{2/3})O_3$	1.0 to 10 mole %

4,601,990

HIGH-ALUMINA CERAMIC COMPOSITION

Minato Ando; Masaaki Ito, and Takashi Kato, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Dec. 17, 1984, Ser. No. 682,715
Int. Cl.⁴ C04B *35/10*
U.S. Cl. 501—153 **1 Claim**

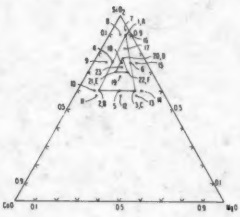
1. A high-alumina ceramic composition having a dielectric loss tangent of 6.7×10^{-5} or less, said composition consisting essentially of Al_2O_3, SiO_2, and MgO, with the Al_2O_3 content being in the range of from 99.7 to 99.9% and the SiO/MgO weight ratio being in the range of from 1.0/1 to 0.2/1.

4,601,991

ALUMINA PORCELAIN COMPOSITIONS

Minato Ando, and Masaaki Ito, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Nov. 22, 1985, Ser. No. 800,855
Claims priority, application Japan, Feb. 8, 1985, 60-23792
Int. Cl.⁴ C04B *35/10*
U.S. Cl. 501—153 **3 Claims**



1. An alumina porcelain composition consisting essentially of from 99.4 to 99.9% by weight Al_2O_3 and a remainder consisting of SiO_2, CaO, and MgO within a compositional range defined by the straight lines connecting the following points A, B, and C in the weight basis ternary composition diagram set forth in the attached drawing:

	SiO_2	CaO	MgO
Point A	0.90	0.025	0.075
Point B	0.60	0.30	0.10
Point C	0.60	0.125	0.275

(unit: weight fraction).

4,601,992

PRODUCT AND PROCESS FOR THE PRODUCTION OF GRANULES OF HIGH MECHANICAL STRENGTH AND CONTAINING MOLECULAR SIEVE

Helmut Derleth; Guenther Sauer, and Karl-Heinz Bretz, all of Nienburg, Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Continuation of Ser. No. 271,808, Jun. 8, 1981, abandoned, which is a continuation of Ser. No. 158,405, Jun. 11, 1980, abandoned, which is a continuation of Ser. No. 009,029, Feb. 2, 1979, abandoned. This application Aug. 6, 1984, Ser. No. 637,695
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1978, 2805546
Int. Cl.⁴ B01J *29/04, 20/18*
U.S. Cl. 502—64 **22 Claims**

1. A process for the production of granules of high mechanical strength and high adsorption capacity comprising forming directly an aqueous paste, the solids thereof consisting essentially of a molecular sieve, a metal oxide and a water soluble silicate, shaping the paste into granules, subjecting the shaped granules to an exchange of bases, drying the granules, and tempering the granules at 300° to 400° C.

2. The process of claim 1 wherein the metal oxide is added in a total amount of from 5% to 94%, the molecular sieve is added in a total amount of from 1% to 95%, and the water soluble silicate is added in a total amount of from 5% to 50% calculated as solids.

4. The process of claim 2 wherein the metal oxide is selected from the group consisting of oxides of copper, barium, zinc,

magnesium, rare earths, titanium, tin, lead, vanadium, antimony, chromium, manganese, iron, cobalt, nickel and mixtures thereof.

17. Granules containing molecular sieves consisting essentially of from 1 to 95% by weight molecular sieve, from 5 to 94% by weight magnesium oxide and from 5 to 46% by weight SiO_2 formed by tempering an admixture of molecular sieve, magnesium oxide and a water soluble silicate.

4,601,993

CATALYST COMPOSITION DEWAXING OF LUBRICATING OILS

Pochen Chu, West Deptford, and Jeffrey H. Yen, Swedesboro, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 614,072, May 25, 1984, abandoned. This application Oct. 17, 1984, Ser. No. 661,632
Int. Cl.[4] B01J *29/32*
U.S. Cl. 502—66 11 Claims

1. A composition having catalytic properties comprising, in combination, a crystalline silicate medium pore zeolite having a Constraint Index between 2 and 12, Zeolite Beta and a hydrogenation component, wherein the ratio of said Zeolite Beta to said medium pore zeolite is not greater than 1.

10. A process for preparing a lube stock dewaxing catalyst, said process comprising:

(a) combining together from about 5 to 60 wt % medium pore zeolite, from about 5 to 60 wt % Zeolite Beta, from 0 to about 50 wt % binder and a sufficient amount of water into a mixture;

(b) extruding said mixture;

(c) drying said mixture; and

(d) incorporating a hydrogenation component into said mixture.

4,601,994

METHOD FOR PREPARING SUPPORTED TI^{III} CATALYSTS

William M. Coleman, III, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 21, 1985, Ser. No. 747,208
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—111 12 Claims

1. A process for preparing a supported trivalent titanium catalyst which process comprises

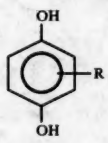
(A) contacting a mixture comprising

(1) at least one tetravalent titanium compound having at least two halogen atoms attached to a titanium atom; and

(2) at least one inert solid inorganic support material; in

(3) at least one inert hydrocarbon diluent; with

(B) at least one compound represented by the formula



wherein R is hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms;

under conditions sufficient to substantially reduce the tetravalent titanium to trivalent titanium.

4,601,995

ORGANO TIN CATALYSTS MODIFIED WITH BICYCLIC AMIDE ACETALS

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 4, 1985, Ser. No. 794,988
Int. Cl.[4] B01J *31/04, 31/12*
U.S. Cl. 502—155 14 Claims

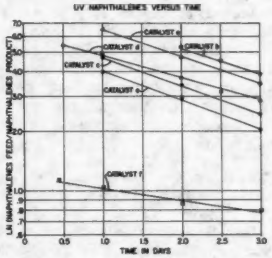
1. An improved catalyst composition comprising an organo tin compound modified by reaction with a bicyclic amide acetal.

4,601,996

HYDROFINISHING CATALYST COMPRISING PALLADIUM

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 13, 1984, Ser. No. 671,139
Int. Cl.[4] B01J *21/08*
U.S. Cl. 502—242 11 Claims



1. An improved hydrogenation catalyst comprising nickel or compounds thereof and tin or compounds thereof and a siliceous matrix used to produce oxidatively stable lubricating oils from hydrocrackate, wherein the improvement comprises adding to said catalyst an amount of palladium or a compound thereof sufficient to reduce the activation temperature of said catalyst wherein the amount of palladium added to said catalyst is in the range of from about 0.03 percent by weight of palladium metal to about 1.0 percent by weight of palladium metal as a percentage of total catalyst weight.

4,601,997

POROUS MULLITE

Barry K. Speronello, River Edge, N.J., assignor to Engelhard Corporation, Menlo Park, N.J.

Filed Dec. 14, 1984, Ser. No. 682,044
Int. Cl.[4] B01J *20/10, 21/12*
U.S. Cl. 502—263 11 Claims

1. A method for producing a material comprising synthetic crystalline mullite which comprises: calcining clay through its exotherm, but without substantial mullite formation, and leaching the resulting calcined clay with an alkaline aqueous solution to remove silica, washing the leached clay to remove alkali ions; drying and then calcining the washed, leached clay at conditions to produce mullite.

2. The method of claim 1 wherein said clay is kaolin clay.

7. The method of claim 1 wherein sufficient silica is removed during leaching to result in a Al_2O_3/SiO_2 molar ratio greater than 3/2.

4,601,998

METHOD AND CATALYST FOR REMOVING CONTAMINANTS FROM HYDROCARBONACEOUS FLUIDS USING A COPPER-GROUP VIA METAL-ALUMINA CATALYST

Stephen M. Oleck, Moorestown; Quang N. Le, Westville, and Daniel J. Neuman, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 524,064, Aug. 17, 1983, Pat. No. 4,539,001.
This application Apr. 16, 1985, Ser. No. 723,694
Int. Cl.[4] B01J *23/28, 23/72*
U.S. Cl. 502—318 2 Claims

1. A particulate catalyst for dearsenating and demetallizing a hydrocarbonaceous fluid consisting essentially of from about 38 to 46 weight percent CuO and 7 to 9 weight percent MoO_3 on a porous alumina support, wherein the total weight of the CuO and the MoO_3 are present in an amount ranging from about 20 to 75 weight percent, based on the total catalyst, the remainder of the catalyst being essentially alumina.

4,601,999

METAL SUPPORT FOR A CATALYST

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19382, and F. Curtiss Dunbar, West Chester, Ohio, assignors to William B. Retallick, West Chester, Pa.

Continuation-in-part of Ser. No. 549,911, Nov. 9, 1983, abandoned. This application May 28, 1985, Ser. No. 738,485
Int. Cl.[4] B01J *23/00*
U.S. Cl. 502—314 10 Claims

1. A metal support for a catalyst, comprising a substantially homogeneous base metal, the base metal having a chromium equivalent percentage above about 8, the chromium equivalent percentage being defined by

$$\text{Chromium equivalent } \% = (\%Cr) + (3.0)(\%Al) + (1.5)(\%Si),$$

the amount of silicon being less than about 1% and the amount of aluminum being less than about 3%, the remainder of the base metal being mostly iron, the base metal having a coating of substantially pure aluminum, wherein the coated base metal comprises a foil having a thickness in the range of about 0.0015–0.0040 inches.

4,602,000

PROCESS FOR MANUFACTURING A CATALYST ON AN ALUMINA SUPPORT AND THE CATALYST PRODUCED BY THE PROCESS

Thierry Dupin, Garches les Gonesses; Jacques Caillod, Taverny; Patrick Leroux, Nanterre, and Germain Martino, Poissy, all of France, assignors to Societe Francaise des Produits pour Catalyse Pro-Catalyse, Rueil-Malmaison, France

Filed Dec. 7, 1984, Ser. No. 679,434
Claims priority, application France, Dec. 9, 1983, 83 19718
Int. Cl.[4] B01J *21/04, 23/74, 23/85*
U.S. Cl. 502—335 13 Claims

1. In a process for the production of a catalyst consisting essentially of (a) a carrier consisting essentially of a major part of alumina and, (b) an active phase consisting essentially of at least one metal from group VIII and at least one additional metal or promoter, wherein the carrier is obtained by admixing a binding agent consisting essentially of a major part of alumina base, with a charge, consisting essentially of a major part of alumina base, shaping and drying the resultant mixture, the proportion by weight of the binding agent amounting to 15–40% of the total carrier, the proportion by weight of the charge amounting to 60–85% of the total carrier, the alumina binding agent consisting essentially of dispersed alumina and 0–30% of non-dispersed alumina, the alumina charge consisting essentially of non-dispersed alumina and less than 10% of dispersed alumina, the dispersion rate of the composition resulting from the mixture of the binding agent with the charge being from 10 to 60%,

the improvement wherein in said process at least a portion of a source of said additional metal is introduced into the binding agent or into the charge prior to completion of the formation of said carrier, and wherein said group VIII metal is incorporated subsequent to inclusion of the additional metal in the carrier, said improvement further comprising simultaneously mixing

(a) the said source of the additional metal

(b) the binding agent and

(c) the charge, the said source of the additional metal penetrating into either the charge or the binding agent, either the charge or the binding agent having previously been saturated with a salt such that the source does not penetrate into the portion of the carrier that has been so saturated.

4,602,001

HIGH-TEMPERATURE EXHAUST GAS CATALYST SUPPORT BODY OF SHEET STEEL WITH A HIGH ALUMINUM CONTENT, AND METHOD FOR MANUFACTURING SAME

Theodor Cyron, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,419
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3415460; European Pat. Off., Jan. 28, 1985, 85100839.1
Int. Cl.[4] B01J *21/04, 35/02*
U.S. Cl. 502—439 24 Claims

1. Structure for conversion into an exhaust gas catalyst support body, said structure constructed of spirally wound or stacked thin steel sheets containing less than one percent aluminum with many contact points between the stacked or rolled-up steel sheets for joining the sheets to each other at the contact points, together with a supplemental material having a composition predominately of aluminum disposed in at least partial regions of the sheets to provide a high aluminum content in the proximity of the joint connections and the surface of the structural material of the catalyst support body.

4,602,002

N-CARBOXYMETHYL SUBSTITUTED LYSYL AND α-(ε-AMINOALKYL) GLYCYL AMINO ACID ANTIHYPERTENSIVE AGENTS

Arthur A. Patchett, Westfield, and Mu T. Wu, Clark, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 7, 1983, Ser. No. 463,412
Int. Cl.[4] A61K *31/405, 37/02;* C07D *207/08*
U.S. Cl. 514—11 5 Claims

1. A compound which is a member of the group:

N^2-[1(S)-carboxy-3-phenylpropyl]-(4-hydroxy-L-lysyl)-L-proline;

N^2-[1(S)-ethoxycarbonyl-3-phenylpropyl]-[5-hydroxy-L-lysyl]-L-proline;

N-[1(S)-carboxy-3-phenylpropyl]-4-fluoro-L-lysyl)-L-proline; and,

N-[1(S)-carboxy-3-phenylpropyl]-(3-fluoro-L-ornithyl)-L-proline.

4. A method of treating hypertension comprising administering to a patient in need of such treatment an antihypertensively effective amount of a compound of claim 1.

4,602,003

SYNTHETIC COMPOUNDS TO INHIBIT INTESTINAL ABSORPTION OF CHOLESTEROL IN THE TREATMENT OF HYPERCHOLESTEROLEMIA

M. René Malinow, Portland, Oreg., assignor to Medical Research Foundation of Oregon, Portland, Oreg.

Filed May 17, 1982, Ser. No. 379,098
Int. Cl.[4] A01N *31/00;* A61K *31/705, 31/58, 31/56*
U.S. Cl. 514—26 15 Claims

1. A method of treating a human or other warm-blooded

animal subject to reduce digestive absorption of cholesterol, the method comprising administering to the subject an effective amount of a nontoxic, substantially pure, synthetic, glycosidic compound selected from the group consisting of glycosides having tigogenin aglycones.

4,602,004

ALOIN AND ALOE-EMODIN CONTAINING PESTICIDES

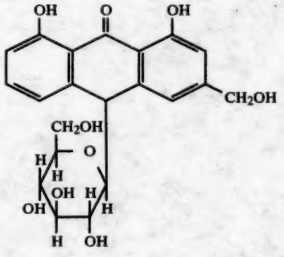
Maurice Cohen, Caracas, Venezuela

Filed Jun. 14, 1984, Ser. No. 620,506

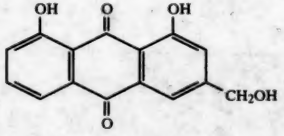
Int. Cl.[4] A61K *31/70, 31/12*

U.S. Cl. 514—23 **9 Claims**

1. A method of killing invertebrate pests comprising exposing said pests to a compound selected from the group consisting of:



and



said compound being present in an amount sufficient to effect said killing.

4,602,005

TIGOGENIN CELLOBIOSIDE FOR TREATING HYPERCHOLESTEROLEMIA AND ATHEROSCLEROSIS

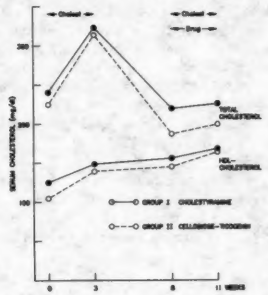
M. Rene Malinow, Portland, Oreg., assignor to Medical Research Foundation of Oregon, Beaverton, Oreg.

Continuation-in-part of Ser. No. 379,098, May 17, 1982. This application Apr. 20, 1984, Ser. No. 602,298

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

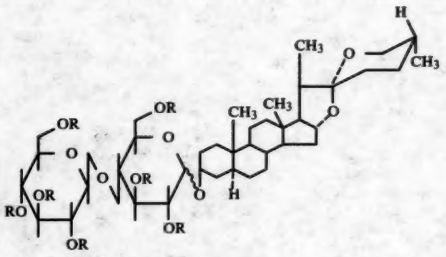
Int. Cl.[4] A01N *45/00;* **A61K** *31/705*

U.S. Cl. 514—26 **14 Claims**



1. A compound of the formula

(A)



wherein R is hydrogen; namely, tigogenin cellobioside.

4,602,006

YNENOLACTONE PROTEASE INHIBITORS

Alexander Krantz, Toronto; Tim F. Tam, and Robin W. Spencer, both of Mississauga, all of Canada, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

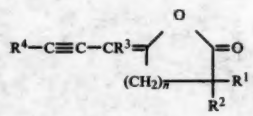
Filed May 9, 1984, Ser. No. 608,340

Int. Cl.[4] C07D *307/58;* **C07F** *7/08;* **A61K** *31/695, 31/365*

U.S. Cl. 514—63 **8 Claims**

1. A compound of the formula

I



wherein n is 1; R^1 is hydrogen or lower alkyl; R^2 is hydrogen, lower alkyl, or phenyl lower alkyl; R^3 is hydrogen or lower alkyl; and R^4 is hydrogen, lower alkyl, or trialkylsilyl; excluding those compounds wherein R^1 and R^2 are hydrogen and R^4 is ethyl, propyl or butyl.

8. A method for inhibiting protease which method comprises administering to a mammal an amount of a compound of formula I of claim 1 which effectively inhibits proteases either alone or in admixture with a pharmaceutically acceptable excipient.

4,602,007

SALICYLATE CULTURE MEDIA FOR INACTIVATION OF BACTERIAL GROWTH INHIBITORS

George M. Fukui; Herbert J. Spencer, and Laurens R. Williams, II, all of Irving, Tex., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 373,829, May 3, 1982, Pat. No. 4,483,926, which is a division of Ser. No. 147,794, May 8, 1980, Pat. No. 4,340,679. This application Nov. 5, 1984, Ser. No. 651,136

Int. Cl.[4] C12Q *1/18*

U.S. Cl. 514—159 **1 Claim**

1. A method for treating blood or blood components containing bacteria, which method comprises adding to the blood or blood component an amount of a salicylate effective to neutralize naturally occurring bacterial growth inhibitor.

4,602,008

ALKYLATED ETIOCHOLANOLONES AND USE AS AN ANTI-DIABETIC, ANTI-OBESITY AND ERYTHROPOIETIC AGENT

George Krsek, Culver, Ind., assignor to Progenics, Inc., New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 681,826

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—178 **18 Claims**

1. A compound selected from the group consisting of 16-methylene-5β-androstan-3α-ol-17-one, and 16-methylene-5β-androstan-3α,7α-diol-17-one, and 16-methyl-5β-androstan-3α,-7α-diol-17-one.

5. A method of inducing an anti-diabetic, anti-obesity or erythropoietic effect in a mammal which comprises administering to the mammal an anti-diabetic, anti-obesity or erythropoietic effective amount of a compound of claim 1.

4,602,009

CORTICOID DERIVATIVES AND PROCESS FOR PRODUCTION THEREOF

Issei Nitta, Machida; Akira Maruyama, Yokohama; Kenichiro Nakao; Motoyoshi Miyake, both of Tokyo, and Hiroaki Ueno, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

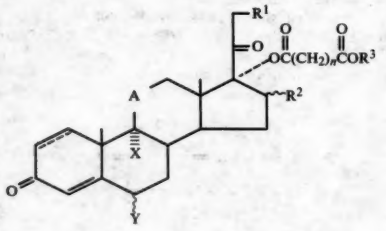
Filed Aug. 28, 1984, Ser. No. 645,100

Claims priority, application Japan, Jun. 12, 1984, 59-120439

Int. Cl.[4] A61K *31/56*

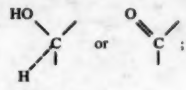
U.S. Cl. 514—179 **14 Claims**

1. A corticoid compound of the formula (I):



(I)

wherein A is a group



X is a hydrogen atom or halogen atom; Y is a hydrogen atom, oxo group, α- or β-halogen atom, hydroxyl group or alkyl group having 1 to 10 carbon atoms; n is an integer of 2 to 5; R^1 is a hydroxyl group, halogen atom, a group represented by the formula (II):

$$-OSO_2R^4, \quad \text{(II)}$$

wherein R^4 is an alkyl group or halogenated alkyl group having 1 to 10 carbon atoms, or a group represented by the formula (III):

$$-OCOR^5, \quad \text{(III)}$$

wherein R^5 is an alkyl group or halogenated alkyl group having 1 to 10 carbon atoms, R^2 is a hydrogen atom or alkyl group having 1 to 10 carbon atoms at the α- or β-position, and the bond between C_1 and C_2 is a single bond or double bond.

14. A pharmaceutical composition consisting of a pharmaceutically effective amount of the derivatives represented by the formula (I) and a pharmaceutically acceptable carrier.

4,602,010

FUNGICIDAL 1-(-2-ARYL-4,5-DISUBSTITUTED-1,3-DIOXOLAN-2-YLMETHYL)-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

Jan Heeres, Vosselaar; Leo Backx, Arendonk; Willy Van Laerhoven, Beerse, all of Belgium, and Elmar Sturm, Aesch, Switzerland, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

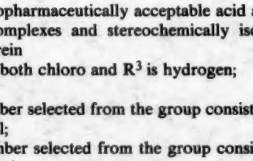
Continuation of Ser. No. 344,850, Feb. 1, 1982, abandoned, which is a division of Ser. No. 202,964, Nov. 3, 1980, Pat. No. 4,329,342, which is a continuation of Ser. No. 53,639, Jun. 29, 1979, abandoned. This application Nov. 7, 1983, Ser. No. 549,041

Claims priority, application Switzerland, Jul. 24, 1978, 7963/78; Jul. 25, 1978, 8001/78

Int. Cl.[4] A01N *43/653, 55/02;* C07D *407/06;* C07F *1/08*

U.S. Cl. 514—184 **6 Claims**

1. A chemical compound selected from the group consisting of an azole derivative having the formula



and the phytopharmaceutically acceptable acid addition salts, metal salt complexes and stereochemically isomeric forms thereof, wherein

R^1, R^2 are both chloro and R^3 is hydrogen;

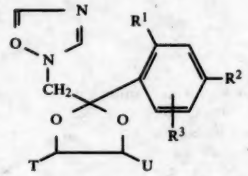
Q is N;

T is a member selected from the group consisting of methyl and ethyl;

U is a member selected from the group consisting of ethyl and propyl.

5. A method of combating fungi which comprises contacting said fungi with an effective antifungal amount of a compound

selected from the group consisting of an azole derivative having the formula



and the phytopharmaceutically acceptable salt addition salts, metal salt complexes and stereochemically isomeric forms thereof, wherein

R^1, R^2 are both chloro and R^3 is hydrogen;

Q is N;

T is a member selected from the group consisting of methyl and ethyl;

U is a member selected from the group consisting of ethyl and propyl.

4,602,011

ANTIMICROBIAL COMPOSITIONS AND METHODS OF USING SAME

Michael H. West, and Fritz J. Nagel, both of Memphis, Tenn., assignors to Chapman Chemical Company, Memphis, Tenn.

Continuation of Ser. No. 175,073, Aug. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 002,555, Jan. 11, 1979, abandoned, which is a continuation of Ser. No. 842,933, Oct. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 625,741, Oct. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 364,018, May 25, 1973, abandoned. This application Sep. 17, 1982, Ser. No. 419,396

Int. Cl.⁴ A01N *55/02*; A61K *31/555*

U.S. Cl. 514—187 **19 Claims**

1. An antimicrobial composition for controlling bacterial and fungi comprising in combination:

(a) a metal chelate of 8-hydroxy quinoline in which the metal is selected from the group consisting of copper, mercury, cadmium, nickel, tin, aluminum and zinc,

(b) an alkyl benzene sulfonic acid wherein the alkyl group is C_6 to C_{18}, said metal chelate being solubilized by said sulfonic acid,

(c) the weight ratio of said metal chelate to said alkyl benzene sulfonic acid being between about 1:5 and 1:14.

4,602,012

CEPHALOSPORIN ANTIBIOTICS

Gordon G. Weingarten, London, England, assignor to Glaxo Group Limited, London, England

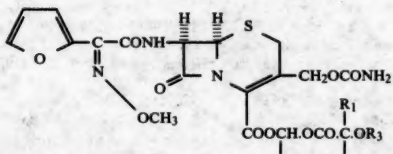
Filed Jan. 2, 1985, Ser. No. 688,354

Claims priority, application United Kingdom, Jan. 3, 1984, 8400024

Int. Cl.⁴ A61K *31/545*; C07D *501/34*

U.S. Cl. 514—202 **7 Claims**

1. Compounds of the formula (I)



(I)

wherein R, R_1 and R_2, which may be the same or different, each represents a hydrogen atom or a C_1–4 alkyl group and R_3 represents a C_1–4 alkyl group, with the proviso that, when both R_1 and R_2 represent hydrogen atoms, R_3 represents other than a methyl group.

7. A method of combating bacterial infections of the human or animal body which comprises orally administering thereto an effective amount of a compound of formula (I) as defined in claim 1.

4,602,013

SUBSTITUTED 2-AMINO-4(1H)PYRIDONES, 7-PYRROLO[1,2-A]PYRIDINONES, 2-QUINOLIZINONES, 7-THIAZOLO[3,2-A]PYRIDINONES AND 2-PYRIDO[1,2-A]AZEPINONES AS VASODILATORS AND BRONCHODILATORS

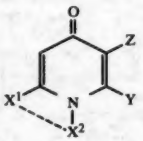
Jack B. Jiang, Neshanic Station, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Feb. 8, 1984, Ser. No. 578,259

Int. Cl.⁴ A61K *31/55*; C07D *221/04*

U.S. Cl. 514—214 **18 Claims**

1. A compound having the formula



and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

$X^1$and X^2 are individually each loweralkyl or together as $—X^1—X^2—$are $—(CH_2)_n—$ or $—S(CH_2)_m—$;

n is 3, 4, or 5;

m is 2 or 3;

Y is amino, loweralkylamino, diloweralkylamino, amido, loweralkyloxy amido, ureido, di(phenylloweralkyl) amino, (diloweralkylamino)methylenamino, or (diloweralkylamino)loweralkylmethylenamino; and

Z is hydrogen, loweralkyl, halo, or phenylloweralkyl.

4,602,014

RING-FUSED PYRAZOLO[3,4-D]-PYRIDIN-3-ONE DERIVATIVES AS BENZODIAZEPINE RECEPTOR MODULATORS

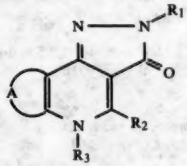
Naokata Yokoyama, Cliffside, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 628,703, Jul. 9, 1984, abandoned. This application Jun. 19, 1985, Ser. No. 746,602

Int. Cl.⁴ A61K *31/55*; C07D *471/04, 471/14*

U.S. Cl. 514—215 **33 Claims**

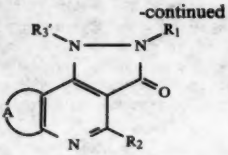
1. A compound of the formula



(IA)

or

-continued



(IB)

wherein

A together with the two carbon atoms to which it is attached represents a fused 5-, 6- or 7-membered carbocyclic or heterocyclic ring selected from

(a) cyclopenteno, cyclohexeno and cycloheptено; each unsubstituted or mono- or di-substituted or carbon atoms within A by lower alkyl, hydroxy, lower alkanoyloxy, aroyloxy, oxo, lower alkoxy, aryl, aryl-lower alkyl or aryl-lower alkoxy;

(b) dihydrothieno, dihydrothiopyrano and tetrahydrothiepino; each unsubstituted or mono- or di-substituted on carbon atoms within A by lower alkyl, lower alkoxycarbonyl, aryl or aryl-lower alkyl; or the S-mono- or di-oxo derivative of any said ring;

(c) dihyrofuro, dihydropyrano, and tetrahydrooxepino; each unsubstituted or mono- or disubstituted on carbon atoms within A by lower alkyl, lower alkoxycarbonyl, aryl or aryl-lower alkyl;

(d) dihydropyrrolo, tetrahydropyrido and tetrahydroazepino; each unsubstituted, or substituted on nitrogen by lower alkoxycarbonyl, carbamoyl, mono- or di-lower alkylcarbamoyl, monoarylcarbamoyl, lower alkyl, aryl-lower alkyl, lower alkanoyl, aroyl or aryl-lower alkanoyl; each unsubstituted or mono- or disubstituted on carbon atoms within A by lower alkyl, oxo, aryl or aryl-lower alkyl;

R_1 represents lower alkyl, phenyl, or phenyl substituted by one or two radicals selected from lower alkyl, lower alkoxy, halogen and trifluoromethyl;

or R_1 represents an aromatic heterocyclic radical selected from pyridyl, quinolyl, isoquinolyl, pyrimidyl and thiazolyl, or any said heterocyclic aromatic radical mono- or di-substituted by lower alkyl, lower alkoxy or halogen; R_2, R_3 and R_3' independently represent hydrogen or lower alkyl; and the term aryl within any of the above definitions represents phenyl or phenyl mono- or disubstituted by lower alkyl, lower alkoxy, hydroxy, lower alkanoyloxy, aroyloxy, halogen or trifluoromethyl; or a pharmaceutically acceptable salt thereof.

32. A method for treating nervous system diseases responsive to benzodiazepine receptor modulation in mammals which comprises administering to a mammal in need thereof an effective amount of a compound of claim 1 or a pharmaceutical composition comprising an effective amount of said compound in combination with one or more pharmaceutically acceptable carriers.

4,602,015

2-PIPERAZINOPYRIMIDINE SALT AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

Emilio Crisafulli, Milan; Marco Frigerio, Mantova, both of Italy, and Jean-Paul Kan, Clapiers, France, assignors to Sanofi, Paris, France

PCT No. PCT/FR84/00156, § 371 Date Feb. 14, 1985, § 102(e) Date Feb. 14, 1985, PCT Pub. No. WO85/00168, PCT Pub. Date Jan. 17, 1985

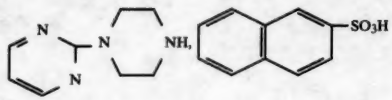
PCT Filed Jun. 21, 1984, Ser. No. 709,691

Claims priority, application France, Jun. 24, 1983, 83 10525

Int. Cl.[4] A61K *31/495;* C07D *403/04*

U.S. Cl. 514—252 4 Claims

1. The 2-(1-piperazinyl)pyrimidine 2-naphthalenesulfonate of formula



2. A pharmaceutical composition having dopaminergic psychotropic action containing, as active ingredient, the compound according to claim 1.

4,602,016

N-(PHENOXYALKYL)IMIDAZOLES AS SELECTIVE INHIBITORS OF THE THROMBOXANE SYNTHETASE ENZYME AND PHARMACEUTICAL COMPOSITIONS THEREOF

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

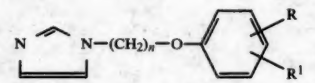
Filed Nov. 19, 1979, Ser. No. 95,755

Claims priority, application United Kingdom, Dec. 13, 1978, 48367/78

Int. Cl.[4] A61K *31/415, 27/00, 31/445;* C07D *233/54*

U.S. Cl. 514—234 9 Claims

1. A compound of the formula



(I)

or the pharmaceutically acceptable acid addition salt thereof, wherein:

R is $CONHR^3$ or $CON(R^4)_2$;

R^1 is H, C_1–C_4 alkoxy or halogen;

R^3 is H, C_1–C_4 alkyl, C_1–C_4 alkanoyl, C_1–C_4 alkylsulphonyl, CN, benzoyl or benzenesulphonyl, or a monosubstituted benzoyl or benzenesulphonyl, the monosubstitutent being C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3 or halogen;

each R^4 is C_1–C_4 alkyl or the two R^4 groups together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino or morpholino group;

R^5 is H, C_1–C_4 alkanoyl, C_1–C_4 alkoxycarbonyl, carbamoyl, C_1–C_4 alkyl carbamoyl;

and n is 2 or 3.

9. A method of selectively inhibiting the thromboxane synthetase enzyme in an animal, which comprises: administering an effective amount of a compound of claim 1 or the pharmaceutically acceptable acid addition salt thereof or of a pharmaceutical composition of claim 8.

4,602,017

SUBSTITUTED AROMATIC COMPOUNDS

David A. Sawyer, 60 Bourne Vale, Hayes, Kent; Martin G. Baxter, 15 Denver Road, Dartford, Kent, and Alistair A. Miller, 91 Elmhurst Gardens, Tonbridge, Kent, all of England

Continuation of Ser. No. 302,365, Sep. 15, 1981, abandoned, which is a division of Ser. No. 154,198, May 29, 1980, abandoned. This application Feb. 27, 1984, Ser. No. 583,286

Claims priority, application United Kingdom, Jun. 1, 1979, 7919257

Int. Cl.[4] A61K *31/53;* C07D *253/06*

U.S. Cl. 514—242 12 Claims

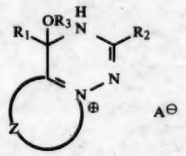
10. A method of treating epilepsy in a human comprising administering to said human an effective epilepsy treatment amount of the compound 3,5-Diamino-6-(2,3-dichlorophenyl)1,2,4-triazine or a pharmaceutically acceptable salt thereof.

4,602,018
CONDENSED AS-TRIAZINE DERIVATIVES

András Messmer; Sándor Bátori; György Hajós, and Pál Benkó, all of Budapest, Hungary, assignors to Egyt Gyogyszevegyeszeti Gyar, Budapest, Hungary

Filed Sep. 20, 1984, Ser. No. 652,612
Claims priority, application Hungary, Sep. 20, 1983, 3242/83
Int. Cl.[4] C07D *253/08;* A61K *31/53*
U.S. Cl. 514—243 **8 Claims**

1. A condensed as-triazinium derivative of the Formula I



(I)

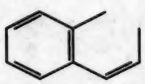
and isomers thereof wherein

R_1 stands for C_{1-10} alkyl or phenyl or naphthyl, wherein the two latter groups may be optionally substituted by one or more halogen, nitro, amino, hydroxy, C_{1-4} alkyl and/or C_{1-4} alkoxy substituent(s);

R_2 is hydrogen, C_{1-4} alkyl, hydroxy, halogen or phenyl or naphthyl, wherein the two latter groups may be optionally substituted by one or more halogen, nitro, amino, hydroxy, C_{1-4} alkyl and/or C_{1-4} alkoxy substituent(s);

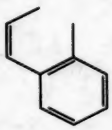
R_3 represents hydrogen or C_{1-4} alkyl;

Z is buta-1,3-dienyl or a group of the Formula (a)



(a)

or (b)



(b)

and

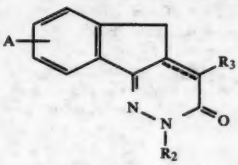
A^- is an anion.

4,602,019
INDENO[1,2-C]PYRIDAZIN-3-ONE DERIVATIVES USEFUL AS CARDIOTONIC AND ANTIHYPERTENSIVE AGENTS

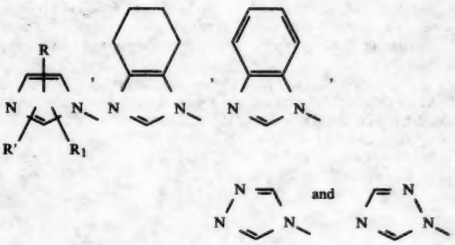
Ila Sircar, and James A. Bristol, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 487,780, Apr. 22, 1983, abandoned. This application Feb. 2, 1984, Ser. No. 575,412
Int. Cl.[4] C07D *403/04;* A61K *31/50*
U.S. Cl. 514—248 **13 Claims**

1. A compound of the formula



wherein represents a single or double bond; R_2 and R_3 are independently hydrogen or lower alkyl; and A is selected from



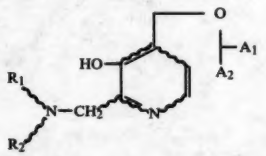
wherein R, R', and R_1 are independently hydrogen, lower alkyl, hydroxy lower alkyl; and R_4 is hydrogen, halogen, hydroxy, lower alkyl, or lower alkyloxy; wherein lower alkyl has from one to six carbon atoms; and the pharmaceutically acceptable salts thereof.

4,602,020
6-AMINOMETHYL-FURO-(3,4-C)-PYRIDINE DERIVATIVES AND THERAPEUTIC COMPOSITIONS CONTAINING THE SAME

André Esanu, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), Paris, France

Filed Jun. 7, 1985, Ser. No. 742,556
Claims priority, application United Kingdom, Jun. 7, 1984, 8414559
Int. Cl.[4] A61K *31/395;* C07D *491/02*
U.S. Cl. 514—302 **3 Claims**

1. 1,3-dihydro-6-aminomethyl-7-hydroxy-furo-(3,4-c)-pyridine derivatives of the general formula I



wherein each of A_1 and A_2 independently represents a hydrogen atom, a straight chain saturated or unsaturated hydrocarbon group having from 1 to 5 carbon atoms, a furyl or thienyl group, a carbomonocyclic group, a phenyloweralkyl group or a phenyloweralkenyl group, each of the groups represented by A_1 and A_2 being unsubstituted or being substituted by one or more chlorine or fluorine atoms, trifluoromethyl groups, alkyl groups having from 1 to 5 carbon atoms, alkoxy groups having from 1 to 5 carbon atoms, alkylthio groups having from 1 to 5 carbon atoms, dialkylamino groups in which each alkyl group has from 1 to 5 carbon atoms, dialkylaminoalkoxy groups in

which each of the two alkyl groups and the alkoxy group has from 1 to 5 carbon atoms or α- or β-alkoxy-N-pyrrolidinyl groups in which the alkoxy group has from 1 to 5 carbon atoms; and each of R_1 and R_2 independently represents a hydrogen atom, a methyl group or an ethyl group, with the proviso that R_1 and R_2 do not simultaneously represent hydrogen atoms or together with the nitrogen atom, form a pyrrolidine, piperidine, morpholine or thiomorpholine ring; and further provides pharmaceutically acceptable salts of such compounds.

3. A method of treating an allergy comprising the administration of an antiallergically effective amount of a compound according to claim 1.

4,602,021

PHENYLBENZOYLUREAS USEFUL AS PESTICIDES

Odd Kristiansen, Möhlin, and Jozef Drabek, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

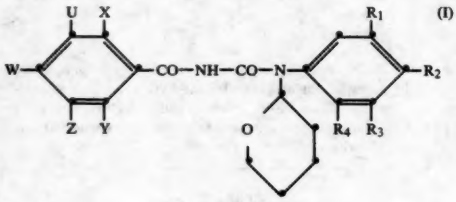
Filed Jun. 17, 1985, Ser. No. 745,456

Claims priority, application Switzerland, Jun. 22, 1984, 3030/84; May 31, 1985, 2316/85

Int. Cl.[4] A01N *43/16*; C07D *309/14*; A01N *43/40*

U.S. Cl. 514—336 **9 Claims**

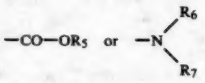
1. A compound of formula I



(I)

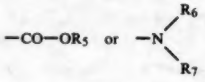
wherein

R_1 is hydrogen, halogen, C_1–C_6alkyl, C_1–C_3haloalkyl containing 1 to 7 halogen atoms, C_1–C_6alkoxy, C_1–C_6alkylthio, C_1–C_3haloalkoxy containing 1 to 7 halogen atoms, nitro, cyano, ethynyl or one of the groups



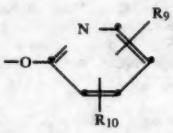
wherein R_5, R_6 and R_7 are C_1–C_6alkyl;

R_2, R_3 and R_4 are each independently hydrogen, halogen, C_1–C_6alkyl, C_1–C_3haloalkyl containing 1 to 7 halogen atoms, C_1–C_6alkoxy, C_1–C_6alkylthio, C_1–C_3haloalkoxy containing 1 to 7 halogen atoms, nitro, cyano, ethynyl or one of the groups



wherein R_5, R_6 and R_7 are C_1–C_6alkyl,

wherein —A— is —O— or —S—, R_8 is halogen, methyl, nitro, CF_3 or cyano and n is 0, 1, 2 or 3, or



wherein each of R_9 and R_{10} independently is hydrogen, chlorine, trifluoromethyl or an ethyl radical perhalogenated with fluorine and/or chlorine; and

U, X, Y, Z and W are each independently hydrogen, halogen, C_1–C_3alkyl, C_1–C_3alkoxy or C_1–C_3alkylthio.

9. A method of controlling insects and representatives of the order Acarina, which method comprises treating said pests and/or the locus thereof with a pesticidally effective amount of a compound according to claim 1 or of a composition containing such a compound.

4,602,022

N-IMIDAZOLYL DERIVATIVES OF BICYCLIC COMPOUNDS

Paolo Cozzi; Germano Carganico; Antonio Pillan, all of Milan, and Umberto Branzoli, Pavia, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

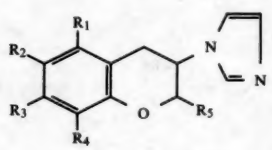
Division of Ser. No. 510,358, Jul. 1, 1983, Pat. No. 4,510,149. This application Nov. 21, 1984, Ser. No. 673,722

Claims priority, application United Kingdom, Jul. 5, 1982, 8219412

Int. Cl.[4] C07D *405/04*; A61K *31/44*

U.S. Cl. 514—337 **18 Claims**

1. A compound of general formula (I)



(I)

wherein

the symbol represents a single or a double bond;

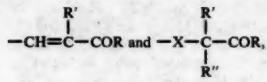
each of R_1, R_2, R_3 and R_4, which may be the same or different, is

(a) hydrogen; hydroxy; halogen; cyano; C_1–C_6 alkyl; C_1–C_6 alkoxy; a C_2–C_4 acyl or C_2–C_4 acylamino group; —SR′,

—CH_2OR', —COR or —CH_2COR, wherein R is —OR′ or

and each of R′ and R″, being the same or different, is hydrogen or C_1–C_6 alkyl; or

(b) one of R_1, R_2, R_3 and R_4 is 5-tetrazolyl or a group selected from —$COCH_2OR'$,



wherein R, R′ and R″ are as defined above, and X is —O—, —S— or —NH—, and the others are as defined above under (a);

R_5 is hydrogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, or a phenyl or 3-pyridyl ring, wherein the phenyl or pyridyl ring is unsubstituted or substituted by one to three substituents chosen from hydroxy and C_1–C_4 alkoxy; or a pharmaceutically acceptable salt thereof.

4,602,023

DIPHENIC ACID MONOAMIDES

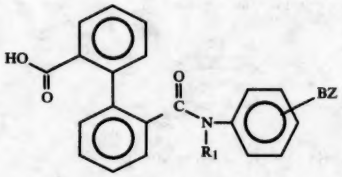
John S. Kiely, Ann Arbor, and Suchin Huang, Canton, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 3, 1985, Ser. No. 740,799

Int. Cl.[4] A61K *31/44, 31/40, 31/19;* **C07C** *103/84*

U.S. Cl. 514—346 **31 Claims**

1. A compound having the formula

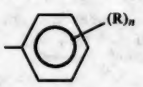


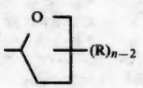
I

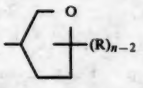
wherein R_1 is hydrogen or lower alkyl of from one to four carbons, inclusive; B is

(a) —$(CH_2)_m$—
(b) —C(O)—CH=CH—
(c) —C(O)—$(CH_2)_q$—
(d) —$(CH_2)_q$—C(O)—
(e) —O—$(CH_2)_q$—
(f) —O—$(CH_2)_m$—O—
(g) —CH(OH)$(CH_2)_q$—
(h) —$(CH_2)_q$CH(OH)—
(i) —CH=CH—C(O)—
(j) —(CH=CH)$_m$—
(k) —$(CH_2)_q$—O—

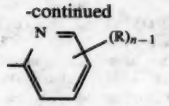
wherein m is an integer from one to six and q is an integer from zero to six and Z is

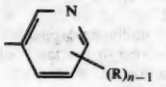
(a)  i

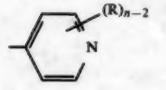
(b)  ii

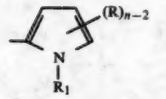
(c)  iii

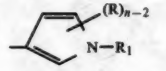
-continued

(d)  iv

(e)  v

(f)  vi

(g)  vii

(h)  viii

wherein n is and integer of zero to five and, R may be the same or different when n is two or more and is lower alkyl of from one to four carbons, hydroxy, alkoxy of from one to four carbons, inclusive, inclusive, halogen, or Z as defined above with the proviso that R may only be attached to a carbon and that each carbon atom may carry only one R, or pharmaceutically acceptable salts thereof; R_1 is lower alkyl up to butyl.

28. A method of treating asthma or allergy by administering to a mammal suffering therefrom an antiasthma or antiallergy effective amount of a compound of claim **1**.

4,602,024

SUBSTITUTED TRIFLUOROMETHYLPHENYLTETRAHYDROPYRIDINES HAVING A CYANO SUBSTITUENT AND AN ANORECTIC ACTIVITY, A PROCESS FOR PREPARING SAME AND PHARMACEUTICAL COMPOSITIONS

Dino Nisato, Pavia; Emilio Crisafulli, Milan; Alberto Bianchetti, Milan, and Paolo Carminati, Milan, all of Italy, assignors to Sanofi, Paris, France

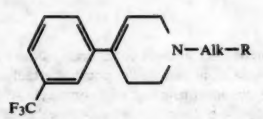
Division of Ser. No. 354,522, Mar. 3, 1982, Pat. No. 4,472,408. This application Jul. 16, 1984, Ser. No. 630,969

Claims priority, application France, Mar. 11, 1981, 81 04890

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—357 **4 Claims**

1. A pharmaceutical composition in dosage unit form with anorectic activity comprising from 1 to 500 mg of an active ingredient selected from the group consisting of trifluoromethylphenyl-1,2,3,6-tetrahydropyridines of formula



wherein R is cyano, and Alk represents a straight or branched alkylene group having 1 to 4 carbon atoms, or a pharmaceutically-acceptable acid addition salt thereof, in admixture with a pharmaceutically-acceptable carrier.

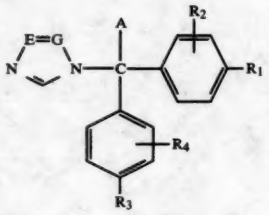
4,602,025

AROMATASE INHIBITORS

Kenneth S. Hirsch, New Palestine; Charles D. Jones, and Harold M. Taylor, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 18, 1984, Ser. No. 621,583
Int. Cl.[4] A61K *31/40, 31/41, 31/415*
U.S. Cl. 514—359 11 Claims

1. A method of inhibiting aromatase in a mammal which comprises administering to said mammal an aromatase inhibiting amount of a compound of the formula



I

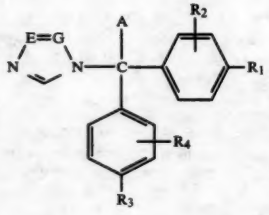
wherein:

A is a 5-membered heterocyclic group containing at least one nitrogen atom beta to the point of attachment selected from the group consisting of 3-pyrrolyl, 4(5)-imidazolyl, 3-pyrazolyl, 4-pyrazolyl, 4-1,2,3-triazolyl, 3-1,2,4-triazolyl, and 5-tetrazolyl;

E and G are independently N or CH; and

R_1, R_2, R_3, and R_4 are independently hydrogen, halo, nitro, C_1–C_3 alkyl, C_1–C_3 alkoxy, or trifluoromethyl; and pharmaceutically acceptable salts thereof.

4. A method of treating estrogen-dependent diseases by inhibiting aromatase in a mammal which comprises administering to said mammal an effective amount of a compound of the formula



I

wherein:

A is a 5-membered heterocyclic group containing at least one nitrogen atom beta to the point of attachment selected from the group consisting of 3-pyrrolyl, 4(5)-imidazolyl, 3-pyrazolyl, 4-pyrazolyl, 4-1,2,3-triazolyl, 3-1,2,4-triazolyl, and 5-tetrazolyl;

E and G are independently N or CH; and

R_1, R_2, R_3, and R_4 are independently hydrogen, halo, nitro, C_1–C_3 alkyl, C_1–C_3 alkoxy, or trifluoromethyl; and pharmaceutically acceptable salts thereof.

4,602,026

OPHTHALMIC TOPICAL AGENT FOR REMEDY OF DISEASES OF IRIS AND CILIARY BODY

Takashi Awata, Amagasaki; Tomio Maenaka, Sanda, and Yutaka Kawamatsu, Kyoto, all of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 30, 1985, Ser. No. 762,747
Claims priority, application Japan, Aug. 3, 1984, 59-163923
Int. Cl.[4] A61K *31/425*
U.S. Cl. 514—369 15 Claims

1. A method for treating iritis, iris paralysis, cyclitis or iridocyclitis which comprises topically administering an effective amount of 5-(3-ethoxy-4-pentyloxyphenyl)-2,4-thiazolidinedione or a pharmaceutically-acceptable salt thereof to an infected eye afflicted with one of these conditions.

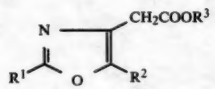
4,602,027

OXAZOLEACETIC ACID DERIVATIVES

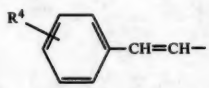
Kanji Meguro, and Takeshi Fujita, both of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 6, 1983, Ser. No. 501,012
Claims priority, application Japan, Jun. 15, 1982, 57-103544
Int. Cl.[4] C07D *263/30;* A61K *31/42*
U.S. Cl. 514—374 16 Claims

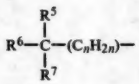
1. A compound of the formula:



wherein R^1 is (A) a group of the formula,



where R^4 is hydrogen, a halogen or trifluoromethyl group, or (B) a group of the formula,



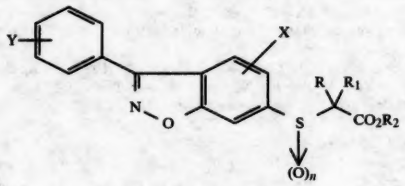
where n is 0 or an integer of 1 to 3; R^5 is hydrogen, or a straight chain or branched alkyl group of 1 to 6 carbon atoms; R^6 and R^7 are respectively a straight chain or branched alkyl group of 1 to 6 carbon atoms, a straight chain or branched alkenyl group of 2 to 6 carbon atoms, a cycloalkyl group of 3 to 7 carbon atoms, or a cycloalkenyl group of 5 to 7 carbon atoms; R^6 and R^7 may be combined with the neighbouring carbon atom to represent a cycloalkyl group of 3 to 7 carbon atoms, a cycloalkenyl group of 5 to 7 carbon atoms, a bicycloalkyl group of 7 to 10 carbon atoms, or a bicycloalkenyl group of 7 to 10 carbon atoms; provided, however, that when n is 0 and R^5 is hydrogen, R^6 and R^7 can be combined only to form a cycloalkenyl group of 5 to 7 carbon atoms, a bicycloalkyl group of 7 to 10 carbon atoms, or a bicycloalkenyl group of 7 to 10 carbon atoms; R^2 is a straight chain or branched alkyl group of 1 to 6 carbon atoms; and R^3 is hydrogen, a straight chain or branched alkyl group of 1 to 6 carbon atoms, or an aralkyl group, or a pharmaceutically acceptable salt thereof.

4,602,028
ANTIHYPERTENSIVE 3-ARYL-1,2-BENZISOXAZOL-SULFONYL AND SULFINYLALKANOIC ACIDS

Richard C. Effland, Bridgewater, and Frank A. Pierrat, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Bridgewater, N.J.

Filed Dec. 14, 1983, Ser. No. 561,537
Int. Cl.[4] A61K *31/42;* C07D *261/20*
U.S. Cl. 514—379 22 Claims

1. A compound of the formula



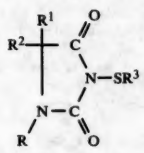
in which R, R_1 and R_2 are the same or different and each is hydrogen or lower alkyl; X and Y are the same or different and each is hydrogen, halogen or lower alkyl, n is the integer 2 and a pharmaceutically acceptable salt thereof.

4,602,029
1-SUBSTITUTED-3-POLYHALOALKYLTHIO HYDANTOIN FUNGICIDES

Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 15, 1984, Ser. No. 661,003
Int. Cl.[4] A01N *43/50;* C07D *233/82*
U.S. Cl. 514—390 20 Claims

1. A compound of the formula:



wherein R is alkoxyalkyl of 2 to 8 carbon atoms, R^1 and R^2 are independently hydrogen or lower alkyl of 1 to 6 carbon atoms; and R^3 is lower alkyl of 1 to 3 carbon atoms substituted with 3 to 6 halogen atoms or trihalovinyl.

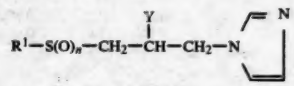
15. A method of controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of a compound of claim 1.

4,602,030
FUNGICIDAL 2-SUBSTITUTED-1-(1-IMIDAZOLYL)-PROPYL ARYL SULFIDES, SULFOXIDES AND SULFONES

Allan F. Rose, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 24, 1984, Ser. No. 614,937
Int. Cl.[4] A01N *43/50;* C07D *233/60*
U.S. Cl. 514—399 17 Claims

1. A compound of the formula:



wherein n is 0, 1 or 2; R^1 is phenyl optionally substituted with 1 to 5 substituents independently selected from halogen, lower alkyl, lower alkoxy, nitro, cyano, lower carbalkoxy or amino optionally substituted with 1 or 2 lower alkyl groups; and Y is $—OCH_2R^2$ wherein R^2 is lower alkenyl optionally substituted with 1 to 5 halogen atoms or

wherein R^3 is phenyl optionally substituted with 1 to 5 substituents independently selected from halogen, lower alkoxy or nitro.

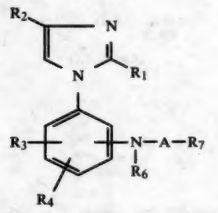
14. A method of controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of a compound of claim 1.

4,602,031
ANTI-DEPRESSANT IMIDAZOLES, COMPOSITIONS AND USE

Motosuke Yamanaka, Abiko; Isao Saito, Chofu; Kiyomi Yamatsu, Kamakura, and Takako Fujimoto, Yokohama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 469,548, Feb. 25, 1983, Pat. No. 4,533,669, which is a division of Ser. No. 252,674, Apr. 9, 1981, Pat. No. 4,402,966, which is a division of Ser. No. 93,469, Nov. 13, 1979, Pat. No. 4,301,169. This application Jun. 6, 1985, Ser. No. 741,935
Claims priority, application Japan, Nov. 14, 1978, 53-139325; Nov. 21, 1978, 53-142813
The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.
Int. Cl.[4] A61K *31/415;* C07D *231/61*
U.S. Cl. 514—399 6 Claims

1. A compound having the formula



in which R_1 is lower alkyl; R_2 is hydrogen or lower alkyl; A is sulfonyl; R_6 is hydrogen, lower alkyl or lower alkylsulfonyl; R_7 is lower alkyl, halogenated lower alkyl, mono- or di-lower alkylamino, mono- or di-lower alkylaminoalkyl, phenyl, phenyl substituted with halogen, lower alkyl, lower alkoxy or trifluoromethyl, phenylamino, phenylamino substituted with halogen, lower alkyl, lower alkoxy or trifluoromethyl; R_3 and R_4, which are the same or different, are hydrogen, lower alkyl, trifluoromethyl, or halogen; or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition for treating depression and depressive states, comprising a therapeutically effective amount of a compound as claimed in claim 1, and a pharmaceutical carrier.

4,602,032
DIBENZ[CD,F]INDOLE DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Rudolf K. A. Giger, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

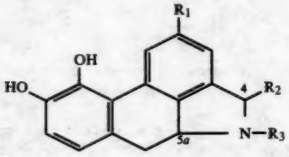
Continuation of Ser. No. 482,214, Apr. 5, 1983, abandoned. This application Dec. 19, 1984, Ser. No. 683,378

Claims priority, application Switzerland, Apr. 13, 1982, 2231/82

Int. Cl.[4] A61K *31/40;* **C07D** *209/56*

U.S. Cl. 514—410 **8 Claims**

1. A compound of formula I in the (4S,5aR) isomer form or in racemate form



(I)

wherein

R_1 is (C_{1-4})alkyl,

R_2 is hydrogen, (C_{1-10})alkyl, (C_{3-7})cycloalkyl or (C_{3-7})cycloalkyl-(C_{1-4})alkyl, and

R_3 is (C_{1-5})alkyl,

or a physiologically hydrolysable and pharmaceutically acceptable ester thereof,

or a pharmaceutically acceptable acid addition salt of the compound or ester.

4,602,033
COMBATING PESTS WITH ARYL N-OXALYL-N-METHYLCARBAMATES

Gerhard Heywang; Engelbert Kühle, both of Bergisch-Gladbach; Wolfgang Behrenz, Overath; Ingeborg Hammann, Muelheim, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

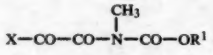
Division of Ser. No. 461,368, Jan. 27, 1983, Pat. No. 4,507,292. This application Jan. 3, 1985, Ser. No. 688,492

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205195

Int. Cl.[4] A01N *43/16, 43/12;* **C07D** *307/79*

U.S. Cl. 514—452 **8 Claims**

1. An aryl N-oxalyl-N-methyl-carbamate of the formula



in which

R^1 represents benzodioxolanyl or dihydrobenzofuranyl each unsubstituted or substituted by loweralkyl, loweralkenyl, loweralkinyl, lower alkoxy, loweralkenoxy, loweralkinoxy, loweralkylthio, loweralkenylthio, loweralkinylthio, diloweralkylamino, halogenolowaralkyl, halogen, nitro, cyano, cyanoalkyl dioxanyl or dioxolanyl, wherein the group R^1 is attached to the adjacent oxygen atom via the benzo portion of the group R^1,

wherein

R^2 represents a phenyl radical which is unsubstituted or substituted by loweralkyl, loweralkenyl, loweralkinyl, halogenoloweralkyl, loweralkoxy, loweralkenoxy, loweralkinoxy, lowralkylthio, diloweralkylamino, halogen, nitro, cyano, cycloloweralkyl, formamidino, dioxanyl and/or dioxolanyl or represents a C_1 to C_6 alkyl, C_3 to C_6 alkenyl or C_3 to C_6 alkinyl adical, these alkyl, alkenyl and alkinyl groups being optionally substituted by halogen, cyano, nitro, amino, hydroxy, loweralkoxy, loweralkylamino or diloweralkylamino.

8. A method of combating pests comprising applying to the pests, or to a habitat thereof, a pesticidally effective amount of a compound according to claim 1.

4,602,034
(OXO-4-4H-(1)-BENZOPYRAN-8-YL) ALKANOIC ACIDS, SALTS AND DERIVATIVES, THEIR MANUFACTURE AND MEDICINES CONTAINING THEM

Philippe Briet, Lyons; Jean-Jacques Berthelon, Decines Charpieu, and Francois Collonges, Beynost Miribel, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyons, France

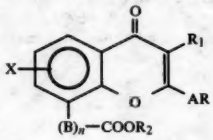
Continuation of Ser. No. 442,191, Nov. 15, 1982, abandoned. This application Nov. 6, 1984, Ser. No. 669,037

Claims priority, application France, Nov. 25, 1981, 81 22020

Int. Cl.[4] A61K *31/35;* **C07D** *311/30, 311/26, 311/22*

U.S. Cl. 514—456 **13 Claims**

1. [OXO-4-4H-[1]-Benzopyran-8-yl]alkanoic acid or an ester thereof, having the formula:



in which AR is phenyl, phenyl substituted by lower alkyl or lower alkoxy, or AR is thienyl, or furyl; R_1 is hydrogen; B is a lower linear or branched alkylene or alkenylene radical; X is hydrogen, lower alkyl or lower alkoxy; n equals 1; R_2 is hydrogen a lower dialkylamino lower alkyl or morpholinoethyl; or an alkali metal salt of said acid.

4,602,035
ANTIDEPRESSANT (3-ARYL-2,3-DIHYDROBENZOFURAN-3-YL)ALKYLAMINES

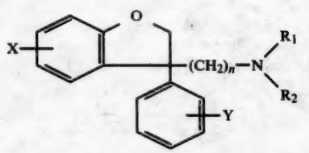
John J. Tegeler, Bridgewater, N.J.; Craig J. Diamond, North Walls, Pa., and Grover C. Helsley, Pottersville, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Dec. 7, 1983, Ser. No. 559,134

Int. Cl.[4] A61K *31/34;* **C07D** *307/81*

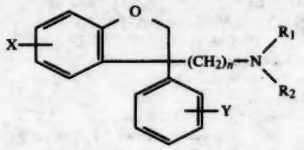
U.S. Cl. 514—469 **29 Claims**

1. A compound of the formula



where n is 2 or 3; X and Y are each independently hydrogen, loweralkyl or halogen, R_1 is loweralkyl, and R_2 is hydrogen, loweralkyl, cyano, beta,beta,beta-trichloroethoxyoxycarbonyl, cyclopropylmethyl, phenethyl or cyanoethyl, with the proviso that when n is 2 and both X and Y are hydrogen, R_2 is not hydrogen or loweralkyl, or a pharmaceutically acceptable acid addition salt thereof.

28. An antidepressant composition comprising an effective depression alleviating amount of a compound of the formula



where n is 2 or 3, X and Y are each independently hydrogen, loweralkyl or halogen, R_1 is loweralkyl, and R_2 is hydrogen, loweralkyl, cyano, beta,beta,beta-trichloroethoxycarbonyl, cyclopropylmethyl, phenethyl or cyanoethyl, with the proviso that when n is 2 and both X and Y are hydrogen, R_2 is not hydrogen or loweralkyl, or a pharmaceutically acceptable acid addition salt thereof and a carrier therefor.

4,602,036

PANTHENOL DERIVATIVES

Alfred Hanck, Riehen, and Horst Pauling, Bottmingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 461,093, Jan. 26, 1983, Pat. No. 4,514,338. This application Jan. 14, 1985, Ser. No. 690,919

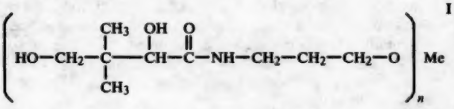
Claims priority, application Switzerland, Feb. 12, 1982, 890/82

Int. Cl.[4] A61K *31/16, 31/315*

U.S. Cl. 514—494 **9 Claims**

1. A pharmaceutical composition useful for promoting the healing of wounds comprising

(a) as an active ingredient a compound of the formula:



I

wherein Me is aluminium and n is the integer 3 or Me is zinc and n is the integer 2 in an amount which is effective for promoting the healing of wounds; and

(b) a pharmaceutically acceptable carrier material suitable for topical administration to the site of the wound.

4,602,037

XANTHATES AND ANTIVIRAL USE THEREOF

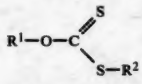
Arthur Scherm, Bad Homburg, and Klaus Hummel, Frankfurt, both of Fed. Rep. of Germany, assignors to Merz+Co. GmbH & Co., Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 324,581, Nov. 24, 1981. This application May 13, 1983, Ser. No. 494,393

Int. Cl.[4] A61K *31/265;* **C07C** *154/02*

U.S. Cl. 514—512 **60 Claims**

1. Xanthates of the formula:



wherein

R^1 is norbornyl, tricyclodecyl, or cyclododecyl, and wherein

R^2 is a mono- or polyvalent metal atom, a straight or branched C_1–C_6-alkyl group which may be substituted by a hydroxy, C_1–C_4-alkoxy, amino, C_1–C_4-alkylamino or $(C_1$–C_4-alkyl$)_2$ amino group or $(C_1$–C_4-alkyl$)_3$ ammonium group or a halogen atom, or represents a 2,3-dihydroxypropyl group or ω-hydroxy-$(C_1$–C_4-alkoxy)methyl group.

15. A pharmaceutical composition having virustatic properties against herpes, influenza, or vaccine virus which comprises an effective antiviral amount of a compound of claim 1 in admixture with a pharmaceutically-acceptable carrier.

4,602,038

INSECTICIDAL CYCLOPROPANE CARBOXYLATES

Jean Tessier, Vincennes; Jean-Pierre Demoute, Montreuil-sous-Bois, and Joseph Cadiergue, Aulnay-sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

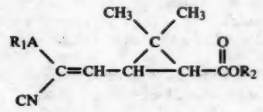
Filed Jun. 8, 1984, Ser. No. 618,596

Claims priority, application France, Jun. 14, 1983, 83 09810

Int. Cl.[4] A01N *53/00;* **C07C** *121/75*

U.S. Cl. 514—521 **15 Claims**

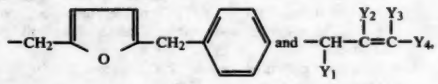
1. A cyclopropane carboxylate in all isomeric forms of the formula



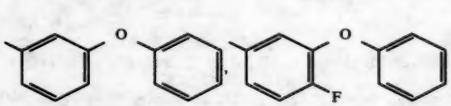
I

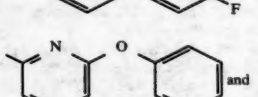
wherein A is selected from the group consisting of —O—, —S—,

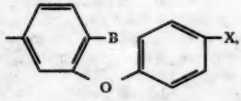
and $—SO_2—$, R_1 is selected from the group consisting of optionally unsaturated alkyl of 1 to 18 carbon atoms optionally containing at least one heteroatom in the carbon chain and optionally substituted with at least one halogen, aryl of 6 to 18 carbon atoms and aralkyl of 7 to 18 carbon atoms and R_2 is selected from the group consisting of



Z is selected from the group consisting of hydrogen, ethynyl and —CN, Ar is selected from the group consisting of phenyl, pentafluorophenyl







B is hydrogen or fluorine, X is fluorine, chlorine or bromine,

Y_1 is selected from the group consisting of hydrogen, fluorine, chlorine, bromine, —C≡N and —C≡CH, Y_2, Y_3 and Y_4 are individually selected from the group consisting of hydrogen, fluorine, chlorine, bromine, alkyl of 1 to 8 carbon atoms and cycloalkyl of 3 to 8 carbon atoms optionally substituted by a functional group selected from the group consisting of halogen, —OH or —SH, —OR', —SR' wherein R' is alkyl of 1 to 8 carbon atoms, $—NO_2$,

wherein R'' and R''' are individually selected from the group consisting of hydrogen and alkyl of 1 to 8 carbon atoms, —C≡N, $—SO_3H$, $—PO_4H_2$, $—COAlK_1$, $—SO_2AlK_2$ and $—SO_3AlK_3$ in which AlK_1, AlK_2 and AlK_3 are alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 8 carbon atoms and alkynyl of 2 to 8 carbons.

11. A method of combatting insects comprising contacting insects with an insecticidally effective amount of at least one compound of claim **1**.

4,602,039

SALTS OF-CARNITINE AND ALKANOYL L-CARNITINES AND PROCESS FOR PREPARING SAME

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

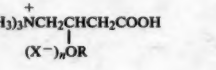
Filed Dec. 11, 1984, Ser. No. 680,380

Claims priority, application Italy, Dec. 28, 1983, 49594 A/83; Nov. 6, 1984, 49123 A/84

Int. Cl.[4] **C07D** *101/30;* **A61K** *31/195*

U.S. Cl. 514—561 **16 Claims**

1. L-carnitine and alkanoyl L-carnitine non-hygroscopic salts of the general formula:



wherein

X^- is an anion selected from the group consisting of acid aspartate, acid citrate, acid phosphate, acid fumarate, lactate, acid maleate, acid oxalate, acid sulphate and orotate anions;

R is hydrogen provided that X^- is other than orotate, or is acetyl, propionyl or butyryl; and

n is ½ is X^- is orotate, and 1 if X^- is one of the other anions.

2. A pharmaceutical composition comprising a salt of claim **1** as the active constituent and a pharmacologically acceptable solid or liquid excipient therefor.

4,602,040

MECLOFENAMIC ACID TOPICAL PHARMACEUTICAL COMPOSITION

Susan C. Belsole, Chester, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 485,973, Apr. 18, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,679

Int. Cl.[4] **A61K** *31/195*

U.S. Cl. 514—567 **14 Claims**

1. A stable non-aqueous clear gel composition suitable for application to an inflammed joint comprising about 3 to 10% by weight meclofenamic acid, about 30 to 60% by weight of a polyethylene glycol ester, about 0 to 20% by weight of polyethylene glycol-75 lanolin oil, about 5 to 10% by weight thickening agent and sufficient alcohol to make a clear gel, wherein the polyethylene glycol ester is selected from the group consisting of polyethylene glycol mono- and dilaurate and polyethylene glycol mono- and dioleate.

4,602,041

BENZYLIDENEAMINO- AND PHENYLACETYLGUANIDINES AND THEIR PHARMACEUTICAL USES

Peter M. Newsome, Cheam; Lee J. Beeley, Dorking, and Stephen F. Moss, Carshalton, all of England, assignors to Beecham Group P.L.C., England

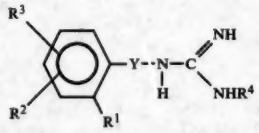
Filed Feb. 8, 1983, Ser. No. 464,978

Claims priority, application United Kingdom, Feb. 10, 1982, 8203916

Int. Cl.[4] **A61K** *31/155;* **C07C** *129/12, 133/10*

U.S. Cl. 514—634 **15 Claims**

1. A compound of formula (I):



(I)

or a salt or acyl derivative thereof;

wherein

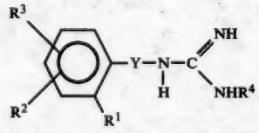
Y is

R^1 is hydroxy, halogen, (C_{1-4}) alkyl, or (C_{1-4})alkoxy,

R^2 is a nitrogen-containing, basic, substituent selected from the group consisting of amino, mono- or di-(C_{1-4}) alkylamino, aminomethyl, mono- or di-(C_{1-4}) alkylaminomethyl, amidino, guanidino and 2-imidazolino, said guanidino and 2-imidazolino being unsubstituted or substituted on a nitrogen atom thereof by C_{1-4} alkyl, C_{1-4} alkanoyl, benzoyl or benzoyl substituted by C_{1-4} alkyl, C_{1-4} alkoxy or amino,

R^3 is hydrogen, hydroxy, halogen, (C_{1-4}) alkyl, (C_{1-4}) alkoxy or a nitrogen-containing, basic substituent selected from the group consisting of amino, mono- or di-(C_{1-4})alkylamino, aminomethyl, mono- or di-(C_{1-4}) alkylaminomethyl, amidino, guanidino and 2-imidazolino, said guanidino and 2-imidazolino being unsubstituted or substituted on a nitrogen atom thereof by C_{1-4} alkyl, C_{1-4} alkanoyl, benzoyl or benzoyl substituted by C_{1-4} alkyl, C_{1-4} alkoxy or amino, and R^4 is hydrogen or hydroxy.

11. A method for treating diarrhoea and scours in human and non-human animals, which comprises administering to a human or non-human animal in need thereof an effective, non-toxic amount of a compound of formula (I):



(I)

or a salt or acyl derivative thereof;

wherein

Y is either —CH=N— or

R^1 is hydroxy, halogen, (C_{1-4}) alkyl, or (C_{1-4})alkoxy,

R^2 is a nitrogen-containing, basic substituent selected from the group consisting of amino, mono- or di-(C_{1-4}) alkyl-

amino, aminomethyl, mono- or di-(C_{1-4}) alkylaminomethyl, amidino, guanidino and 2-imidazolino, said guanidino and 2-imidazolino being unsubstituted or substituted on a nitrogen atom thereof by C_{1-4} alkyl, C_{1-4} alkanoyl, benzoyl or benzoyl substituted by C_{1-4} alkyl, C_{1-4} alkoxy or amino,

R^3 is hydrogen, hydroxy, halogen, (C_{1-4}) alkyl, (C_{1-4}) alkoxy or a nitrogen-containing, basic substituent selected from the group consisting of amino, mono- or di-(C_{1-4})alkylamino, aminomethyl, mono- or di-(C_{1-4}) alkylaminomethyl, amidino, guanidino and 2-imidazolino, said guanidino and 2-imidazolino being unsubstituted or substituted on a nitrogen atom thereof by C_{1-4} alkyl, C_{1-4} alkanoyl, benzoyl or benzoyl substituted by C_{1-4} alkyl, C_{1-4} alkoxy or amino, and R^4 is hydrogen or hydroxy.

4,602,042

CONTRACEPTIVE METHODS

Eric N. Chantler, Stockport; Francis G. Hutchinson, Lymm, and Deborah A. Sharman, Padfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 7, 1984, Ser. No. 638,641

Claims priority, application United Kingdom, Oct. 14, 1983, 8327561

Int. Cl.[4] A61K *31/155*

U.S. Cl. 514—635 **2 Claims**

1. A contraceptive method which comprises applying to the mucus in the vagina of the female mammal, a mucospissic spermicidal or sperm-immobilizing amount of a bisbiguanide compound of the formula:

$$R^1R^2N.C(:NH)N:C(NH_2)N—A—N.C(NH_2):N.C(:NH)NR^3R^4 \quad I$$

wherein either:

(i) R^1 and R^3, which may be the same or different, are each a phenyl radical which is substituted by alkyl, alkoxy, nitro or halogen, R^2 and R^4 are both hydrogen, and A is a 3–9C polymethylene diradical, wherein the polymethylene chain may be interrupted by aromatic nuclei; or

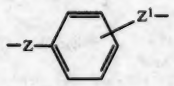
(ii) the bivalent bridge A is:

(a) alkylene of from 2 to 12 carbon atoms having the valence bonds attached to different carbon atoms,

(b) $—(CH_2)_m—X—(CH_2)_n—$ wherein m and n each represent an integer from 2 to 6 and X is O or S,

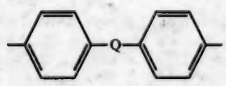
(c)

(d)



wherein Z and Z^1 are each alkylene of from 1 , to 3 carbon atoms,

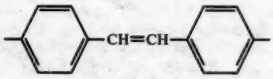
(e)



wherein Q is —O—, —S—, —SO— or —SO_2—,

(f)

or



R^1 and R^3 are each:

(a) alkyl of from 6 to 16 carbon atoms, or

(b) alkyl-Y-alkylene, wherein Y is O or S and the alkyl and alkylene radicals together contain 3 to 15 carbon atoms; and R^2 and R^4 are each hydrogen or 1–6C alkyl;

or an acid addition salt thereof.

4,602,043

TREATMENT FOR HYPOGLYCEMIA

W. Blair Geho, Wooster, Ohio, assignor to Technology Unlimited Inc., West Wooster, Ohio

Continuation-in-part of Ser. No. 514,492, Jul. 18, 1983, abandoned. This application Apr. 26, 1984, Ser. No. 604,154

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—646 **3 Claims**

1. The method of treating a warm-blooded animal having an abnormal liver uptake of glucose resulting in low levels of glucose in the peripheral system with symptoms of hypoglycemia, which comprises administering to said warm blooded animal having abnormal liver uptake of glucose, a therapeutic dose of cyproheptadine.

4,602,044

β-PHENETHANOLAMINE ANTIOBESITY AGENTS

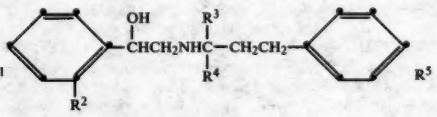
Klaus K. Schmiegel, and Walter N. Shaw, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 19, 1983, Ser. No. 562,960

Int. Cl.[4] A61K *31/205*

U.S. Cl. 514—653 **17 Claims**

1. A compound of the formula



wherein:

R^1 is hydrogen or hydroxy;

R^2 is hydrogen or fluoro;

R^3 is hydrogen or C_1–C_2 alkyl;

R^4 is hydrogen or methyl;

R^5 is nitro or SO_2CH_3; and the pharmaceutically acceptable acid addition salts thereof.

15. A method for effecting weight reduction in an obese subject comprising administering an anti-obesity effective amount of a compound of claim **1**.

4,602,045

CATION-EXCHANGE RESINS AND USE AS MEMBRANES IN ELECTROLYTIC CELLS

Michael V. Markus, East Malvern, and George H. Barnett, North Balwyn, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

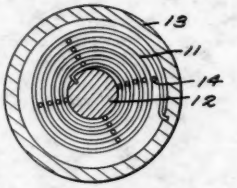
PCT No. PCT/AU81/00171, § 371 Date Jun. 17, 1982, § 102(e) Date Jun. 17, 1982, PCT Pub. No. WO82/01882, PCT Pub. Date Jun. 10, 1982

Continuation of Ser. No. 395,055, Jun. 17, 1982, abandoned. This PCT application Nov. 26, 1981, Ser. No. 732,900

Claims priority, application Australia, Nov. 27, 1980, PE6668

Int. Cl.[4] C08F *259/08, 214/26, 2/54;* C08J *7/18*

U.S. Cl. 521—27 8 Claims



1. A process for treating a fluoropolymeric permselective membrane to improve its resistance to back-migration of hydroxyl ions when it is used in a chloralkali electrolysis cell, which process comprises contacting the surface of a preformed fluoropolymeric permselective membrane derived from a copolymer of tetrafluoroethylene and perfluorovinyl sulfonyl fluoride, with a monomer selected from the group consisting of perfluorobutenoic acid, methyl perfluorobut-3-enoate and ethyl perfluorobut-3-enoate, and then irradiating said membrane, while the surface thereof is in contact with said monomer, with high energy radiation so that the monomer is graft copolymerized onto said membrane, the resulting chemical bonding of the monomer to the polymer membrane increasing the resistance of said membrane to back-migration of hydroxy ions.

4,602,046

RECOVERY OF POLYESTER FROM SCRAP BY HIGH SHEAR CONDITIONS

Kenneth R. Buser, Wilmington, Del., and Thomas A. Rettig, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 22, 1985, Ser. No. 693,253

Int. Cl.[4] C08J *11/04, 11/06*

U.S. Cl. 521—46 11 Claims

1. A process for the recovery of plastic material from articles having a plastic base material and at least one layer of a macromolecular organic polymer having different tensile properties which comprises:

mixing pieces of the plastic article ranging in size from about 2 to about 20 millimeters in the longest dimension, with a caustic alkali solution wherein the resulting mixture has a solids concentration level of at least 25 percent by volume,

subjecting the mixture to conditions of high shear unitl the polymer layer is removed from the pieces and to comminute the polymer layer to particles having maximum size of about 150 microns, and

separating the polymer particles to recover pieces of essentially pure plastic material.

4,602,047

PROCESS FOR PRODUCING FOAMED PARTICLES OF POLYOLEFIN RESIN

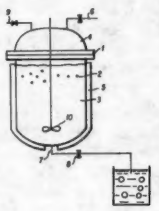
Hiroshi Endo; Hiroshi Matsui, and Takanori Suzuki, all of Mie, Japan, assignors to Yuka Badische Co., Ltd., Yokkaichi, Japan

Filed Aug. 15, 1984, Ser. No. 640,811

Claims priority, application Japan, Aug. 26, 1983, 58-156056

Int. Cl.[4] C08J *9/22*

U.S. Cl. 521—58 7 Claims



1. A process for producing foamed particles of a polyolefin resin which comprises dispersing polyolefin resin particles in water in a closed vessel provided with a discharge port that is initially closed, the water surface in the closed vessel being above the level of the discharge port, feeding a voltatile organic blowing agent into the closed vessel, heating the aqueous dispersion so produced to a temperature above the softening point of the polyolefin resin paritlces but below their melting point, thereby impregnating the polyolefin resin particles with the blowing agent, to produce impregnated polyolefin resin particles, establishing a pressure within the closed vessel which is above that of the atmosphere into which the dispersion is to be discharged, opening the discharge port thereby releasing the aqueous dispersion containing the impregnated polyolefin resin particles into said atmosphere kept at a lower pressure than the pressure within the closed vessel, while permitting the pressure within the closed vessel to drop due to the release of said aqueous dispersion; wherein

(i) when the last portion of the aqueous dispersion containing the polyolefin resin particles impregnated with the blowing agent is released from the closed vessel, the pressure within the closed vessel is at least 5 $kg/cm^2.G$, and

(ii) in order to maintain the pressure within the closed vessel at the time of releasing the last portion of the aqueous dispersion from the closed vessel at at least 5 $kg/cm^2.G$, a pressurized inorganic gas is introduced into the closed vessel to apply higher pressure before or after the heating of the aqueous dispersion is started, but prior to releasing of the aqueous dispersion, provided that additional iorganic gas is not supplied to the closed vessel after starting the releasing of the aqueous dispersion.

4,602,048

ARYLOXY-ALKOXY-ALLYLPHENOXY SUBSTITUTED POLYPHOSPHAZENES

Harold R. Penton, Prairieville, and F. Alexander Pettigrew, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 683,022, Dec. 18, 1984. This application Nov. 20, 1985, Ser. No. 799,942

Int. Cl.[4] C08J *9/10*

U.S. Cl. 521—82 24 Claims

1. A cured polyphosphazene foam having a density below about 6 pounds per cubic foot said foam comprising about 10–65 weight percent inorganic filler and about 20–50 weight percent of a cured polyphosphazene elastomer which has a $+P<=N+_n$ backbone in which n has an average value of about 100–1,000,000 or more and the substituents bonded directly to phosphorus comprise about 20–80 mole percent phe-

noxy, 20–80 mole percent lower alkylphenoxy, 1–50 mole percent alkoxy and 0.5–20 mole percent alkenylphenoxy and said substituents are randomly distributed along said backbone.

4,602,049

NOVEL PRODUCT AND PROCESS OF ISOCYANURATE PRODUCTION

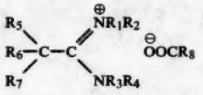
Dale F. Regelman, Wallingford, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 571,391, Jan. 16, 1984, Pat. No. 4,567,257. This application Sep. 23, 1985, Ser. No. 778,647

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—129 5 Claims

1. A method for converting an organic isocyanate into a product containing isocyanurate and carbodiimide linkages said method comprising contacting said isocyanate with a catalyst comprising an amidinium salt having the formula



wherein R_1, R_2, R_3, and R_4, when taken individually, are independently selected from the group consisting of lower-alkyl, aralkyl, cycloalkyl, and, when taken together with the respective nitrogen atoms to which they are attached R_1 together with R_2 and R_3 together with R_4 independently represent heterocyclic groups have 5 to 7 ring atoms, and R_5, R_6, R_7, and R_8 are independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl.

4,602,050

METHOD FOR CROSS-LINKING ORGANOPOLYSILANE POLYMERS

Robert C. West, Madison, Wis., and Peter I. Djurovich, Isla Vista, Calif., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 8, 1985, Ser. No. 720,596

Int. Cl.[4] C08L *83/16;* C07F *7/08*

U.S. Cl. 522—135 13 Claims

1. A method for cross-linking organopolysilane polymers comprising the steps of:

(a) mixing an organopolysilane with a cross-linking agent to make a reaction mixture, the cross-linking agent including molecules having at least two carbon-carbon double bonds and a ratio of such bonds to the molecular weight of the molecule no less than 1 to 150; and

(b) inducing radical formation in the organopolysilane of the reaction mixture using a means of inducing radical formation appropriate for the number of carbon-carbon double bonds present in the molecules of the cross-linking agent to cause formation of a reaction product including cross-linked organopolysilane polymers.

4,602,051

RESIN COMPOSITION HAVING ELECTROMAGNETIC WAVE SHIELDING EFFORT

Takeshi Nabeta, and Isamu Hanahara, both of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,938

Claims priority, application Japan, Sep. 7, 1983, 58-164353; Sep. 14, 1983, 58-169909; Dec. 2, 1983, 58-227019; Dec. 28, 1983, 58-247068; Mar. 10, 1984, 59-46277

Int. Cl.[4] G21F *1/10;* G21K *1/10;* C08K *5/17, 3/04*

U.S. Cl. 523—137 17 Claims

1. A resin composition having an electromagnetic wave shielding effect, comprising:

35 to 90 wt % of a copolymer of an ethylenic unsaturated nitrile, a diene rubber and an aromatic vinyl compound or a mixture of said copolymer with another copolymer of an ethylenic unsaturated nitrile and an aromatic vinyl compound;

1 to 25 wt % of a plasticizer;

5 to 40 wt % of carbon fibers, said carbon fibers being selected from the group consisting of carbonized polyacrylonitrile fibers, carbonized pitch fibers, carbonized phenolic compound fibers and mixtures thereof; and

0.5 to 10 wt % of an alkylamine anistatic agent.

4,602,052

RUBBER COMPOSITION AND METHOD OF INCORPORATING CARBON BLACK AND A QUATERNARY AMMONIUM COUPLING AGENT SALT INTO NATURAL RUBBER CONTAINING COMPOSITIONS

Kenneth E. Weber, Pacific Palisades, Calif., and Dirk Oberlin, Aurora, Colo., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 534,347, Sep. 21, 1983, abandoned, which is a continuation of Ser. No. 398,995, Jul. 16, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,616

Int. Cl.[4] C08K *3/04, 5/19, 9/04;* C08J *3/00*

U.S. Cl. 523—215 26 Claims

1. A method of compounding rubber comprising mechanically mixing and substantially uniformly dispersing the following materials in a rubber comprising at least about 5% natural rubber:

A. (1) a reinforcing filler consisting essentially of particulate carbon black having a median particle size in the range of from about 0.001 to about 20 microns, and

A. (2) a coupling agent consisting essentially of a quaternary ammonium salt at a level of from about 0.005 to about 15 phr; or

B. a particulate adduct of a reinforcing filler consisting essentially of the particulate carbon black and a coupling agent consisting essentially of the quaternary ammonium salt, having a median particle size in the range of from about 0.001 to about 20 microns and present at a level such that the portion thereof contributed from the quaternary ammonium salt is at a level of from about 0.005 to about 15 phr,

wherein the amount of the carbon black or the portion of the aforesaid adduct contributed from the carbon black are in the range of from about 5 to about 400 phr.

4,602,053

CHIP-RESISTANT PAINT CONTAINING EPOXYESTER LINEAR BLOCK OLIGOMER

Jozef T. Huybrechts, Turnhout; Ferdinand F. Meeus, Mechlin, and August T. Timmerman, Westerlo, all of Belgium, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 24, 1984, Ser. No. 613,413

Int. Cl.[4] C08K *3/10;* C08L *63/00, 63/02*

U.S. Cl. 523—436 4 Claims

1. A chip resistant coating paint composition consisting essentially of a block-copolymerized linear oligomer having an average of 3 to 20 mole units of alternating units of

n moles of linear epoxy oligomers made by reacting epichlorohydrin and bisphenol A and terminated with oxirane groups on each end and an $\overline{Mn}$ in the range of 300–2000, and

(n−1) moles of fatty acid units terminated with carboxylic acid groups on each of two ends and having at least 9 carbon atoms,

said linear oligomer being terminated on each end with units of said epoxy oligomers

said coating composition having a pigment volume concentration in the range of 1 to 20 percent.

4,602,054

RUBBER COMPOSITIONS AND RELATED ARTICLES HAVING IMPROVED METAL ADHESION AND METAL ADHESION RETENTION

Jung W. Kang, Clinton, and James A. Davis, Uniontown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 575,260, Jan. 30, 1984, Pat. No. 4,511,628. This application Mar. 18, 1985, Ser. No. 713,168

Int. Cl.[4] B32B *15/04;* C08K *5/47, 5/56*

U.S. Cl. 524—83 4 Claims

1. A method for improving metal adhesion and metal adhesion retention properties between a vulcanizable rubber composition and metal comprising the sequential steps of:

dispersing from about 0.5 to about 10.0 parts by weight of bis(2-mercaptobenzothiazato)nickel per 100 parts of the rubber component in said rubber composition

embedding said metal into said rubber composition thereby applying said rubber composition containing bis(2-mercaptobenzothiazato)nickel to said metal prior to curing and

curing said rubber composition containing said metal.

4,602,055

PROCESS FOR PAD DYEING CELLULOSIC TEXTILE MATERIALS

Paul Schäfer, Riehen, and Hans-Ulrich Berendt, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 559,121, Dec. 7, 1983, Pat. No. 4,494,956. This application Jun. 4, 1984, Ser. No. 617,443

Claims priority, application Switzerland, Dec. 14, 1982, 7268/82; Oct. 6, 1983, 5431/83

Int. Cl.[4] C08G *65/08;* C08K *5/42;* C08L *71/02*

U.S. Cl. 524—157 9 Claims

1. A graft polymer comprising: (a) an adduct of 4 to 100 moles alkylene oxide, selected from the group consisting of ethylene oxide, propylene oxide or mixtures of both, with an at least trihydric aliphatic alcohol of 3 to 10 carbon atoms, and (b) acrylamide or methacrylamide.

4,602,056

USE OF GRAFTED ETHYLENE-VINYLACETATE COPOLYMERS FOR THE PRODUCTION OF HOTMELT ADHESIVES

Helmut Waniczek, Cologne; Gerhard Hohmann, Leverkusen; Herbert Bartl, Odenthal, and Ludwig Mott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 579,768, Feb. 13, 1984, abandoned. This application May 10, 1985, Ser. No. 733,239

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306202

Int. Cl.[4] C08L *23/08, 31/04, 51/00*

U.S. Cl. 524—272 4 Claims

1. Hot melt adhesvie comprising a graft copolymer mixed with a tackifying resin wherein the graft copolymer is obtained by grafting 0.5 to 10% by weight of monomer units which consist of 80 to 100% by weight of methacrylic acid units onto 90 to 99.5% by weight of a graft base comprising

a copolymer of 50 to 85% by weight of ethylene units and 15 to 50% by weight of vinyl acetate units and having been peroxygenated with atmospheric oxygen under pressure in the melt to a level of 50 to 3,000 ppm of active oxygen.

4,602,057

COPOLYAMIDE ADHESIVE CONTAINING BEHENIC ACID

Josef Hefele, Gräfelfing, Fed. Rep. of Germany, assignor to Kufner Textilwerke GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,024

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336417

Int. Cl.[4] C08L *77/00*

U.S. Cl. 524—300 17 Claims

1. A heat-sealing adhesive consisting of a copolyamide and 0.3 to 15% by weight behenic acid.

4,602,058

COMPATIBILITY AND STABILITY OF BLENDS OF POLYAMIDE AND ETHYLENE COPOLYMERS

Stephen L. Graham, Richwood, and Laura A. Kelly, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 2, 1984, Ser. No. 627,327

Int. Cl.[4] C08K *5/17, 5/09;* C08L *33/02, 77/00*

U.S. Cl. 524—320 15 Claims

1. A blend consisting essentially of

(a) at least one polyamide,

(b) at least one ethylene copolymer containing carboxylic acid groups, and

(c) a minor amount of at least one organic carboxylic acid in an amount effective to improve the compatibility and thermal stability of the blend, said organic carboxylic acid(s) being characterized as melting in, or dissolving in, the blend at the temperature employed for the blending operation, and being reactable with any functional amine groups which are present in the blend at the blending temperature or which become available through chain scission or degradation of the polyamide at such temperature,

wherein said ethylene copolymer is at least one selected from the group consisting of ethylene/acrylic acid, ethylene/methacrylic acid, ethylene/crotonic acid, and ethylene/1-butenoic acid, and

wherein said organic carboxylic acid consists of at least one of

(i) HOOC—R—COOH, wherein R is C_1–C_{14} alkylene or alkenylene or OH substituted C_1–C_{14} alkylene or alkenylene or combinations of these,

(ii) multi-carboxylic acid compounds of the group consisting of citric acid, pyromellitic acid, and EDTA.

4. The blend of claim 1 wherein the organic carboxylic acid is sebacic acid or tartaric acid.

4,602,059

POLYMERIC COMPOSITIONS USEFUL AS BINDERS IN COATING COLORS AND COATING COLORS PREPARED THEREFROM

Bernardus J. M. S. van Rooden, Richterswil, Switzerland, and José L. T. Martinez, Rheinmünster, Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US83/00617, § 371 Date Dec. 22, 1983, § 102(e) Date Dec. 22, 1983, PCT Pub. No. WO83/03839, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 27, 1983, Ser. No. 605,026

Claims priority, application European Pat. Off., May 3, 1982, 82.200530.2

Int. Cl.[4] B32B *23/08, 27/10;* C08L *25/10, 33/02*

U.S. Cl. 524—521 15 Claims

1. A polymeric composition useful as a coating color, comprising based on 100 weight parts, from about 50–97 weight parts of a binder copolymer comprising, at least 60 weight percent, in polymerized form, of a monovinylidene aromatic and a conjugated diene, the monovinylidene aromatic and conjugated diene being employed in amounts such that the monovinylidene aromatic comprises from about 10–90 weight

percent and the conjugated diene comprises from about 10–90 weight percent of the total weight of the monovinylidene aromatic and conjugated diene employed, and optionally, in polymerized form, up to 20 weight percent of an α,β-ethylenically unsaturated carboxylic acid and up to 20 weight percent of other copolymerized monomers, and from about 3–50 weight parts of a rheology control copolymer comprising, in polymerized form, from about 40–90 weight percent of an ester of an α,β-ethylenically unsaturated carboxylic acid, from about 1–30 weight percent of an α,β-ethylenically unsaturated carboxylic acid, from about 5–15 weight percent of an ethylenically unsaturated carboxamide, from about 0.5–20 weight percent of an unsaturated nitrile and from about 0.01–10 weight percent of a cross-linking monomer, and optionally, from 0–20 weight percent of other copolymerizable monomers.

10. A paper coating color comprising a suspension of a pigment and/or filler in an aqueous medium and containing a binder component of a binder copolymer and rheology control copolymer, wherein the polymeric composition comprises based on 100 weight parts from about 60–90 weight parts of a binder copolymer derived from about 35–60 weight percent of an ester of an acrylic and/or methacrylic acid with an alcohol having from 1–8 carbon atoms, from about 35–60 weight percent of a vinyl acetate and/or vinyl propionate, and, optionally, up to 10 weight percent of a copolymerizable monomer, said weight percents being based on the total weight of the binder copolymer and from about 10–40 weight parts of a rheology control copolymer derived from about 40–90 weight percent of an ester of acrylic acid with an alcohol having from 1–8 carbon atoms, from about 5–40 weight percent of acrylic and/or methacrylic acid, from about 0.5–10 weight percent of acrylamide and/or methacrylamide, up to 10 weight percent of other copolymerizable monomers and from about 0.05–2 weight percent of a cross-linking monomer, said weight percents being based on the total weight of the rheology control polymer.

4,602,060

TWO-COMPONENT MOLD RELEASE SYSTEM AND METHOD

Sheldon L. Clark, Boca Raton, and Frank P. Pajaujis, Deerfield Beach, both of Fla., assignors to Frekote, Inc., Boca Raton, Fla.

Filed Apr. 25, 1983, Ser. No. 488,018
Int. Cl.[4] C09D *5/00*
U.S. Cl. 524—745 **24 Claims**

11. A unitary two-coat mold release system: for sequential application to a mold surface, comprising:

a top coating material for said mold surface including a water-soluble, metallic salt of a long-chain fatty acid for providing a releasing interface for molded articles; and

a base coating material for said mold surface including a silicone polymer release agent and a bonding and cross-linking agent, said bonding and cross-linking agent being reactive with said silicone polymer release agent and providing bonding between said base coating and said mold surface and between said base coating and said top coating.

13. A two-coat mold release system as recited in claim **11** wherein said top coating further includes a sodium sulfate of a long-chain fatty alcohol.

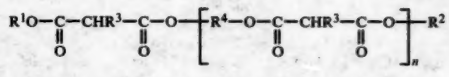
4,602,061

LIQUID, 2-COMPONENT COATING COMPOSITION CURABLE AT AMBIENT TEMPERATURE COMPRISING A MALONATE COMPOUND AND AN UNSATURATED CARBONYL COMPOUND, AND THE MICHAEL ADDITION PRODUCT THEREOF

Jaap M. Akkerman, Haarlem, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Mar. 26, 1985, Ser. No. 716,273
Claims priority, application Netherlands, Mar. 29, 1984, 8401007
Int. Cl.[4] C08G *63/02*
U.S. Cl. 525—10 **11 Claims**

1. A liquid coating composition comprising a compound with an activated CH group and an α,β-ethylenically unsaturated carbonyl compound, characterized in that the compound with an activated CH group is a compound of the formula



where R^1, R^2, and R^4 are independently chosen organic radicals; R^3 is an H atom, a group R^5, or a group of the formula $—CH^2$, $—CHR^6$, or $—COOR^5$; R^5 represents an alkyl group having 1–18 carbon atoms; R^6 represents an H atom or a methyl group; and n is at least 1, which compound has a molecular weight in the range of from 250 to 50,000.

4,602,062

CONVERSION OF POLYVINYL ALCOHOL TO ACRYLIC ACID POLYMER

John M. Larkin, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,931
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—61 **7 Claims**

1. A process for preparing an acrylic acid polymer which comprises the steps of reacting at least a portion of the hydroxyl groups of polyvinyl alcohol with formic acid to convert at least a portion of the hydroxyl groups of the polyvinyl alcohol to an intermediate containing formate groups and bringing the intermediate into contact with activated carbon in the presence of carbon monoxide, a soluble group VIII transition metal catalyst and an alkyl halide promoter to thereby provide a reaction product comprising a polymer wherein the formate groups of the said intermediate are converted to carboxyl groups to thereby provide said acrylic acid polymer, said catalyst being soluble in said intermediate or an organic solvent solution of said intermediate.

4,602,063

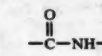
PRODUCTION OF REINFORCED RUBBER COMPOSITION

Shinji Yamamoto, Yotsukaido; Kohei Kaijiri, Chiba, and Koichi Nagakura, Hirakata, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Dec. 26, 1984, Ser. No. 686,278
Claims priority, application Japan, Dec. 27, 1983, 58-244814
Int. Cl.[4] C08L *75/04, 77/00*
U.S. Cl. 525—127 **11 Claims**

1. A process for producing a reinforced rubber composition comprising the steps of:

mixing 100 parts by weight of a vulcanizable synthetic rubber other than butadiene rubber, 1 to 200 parts by weight of a thermoplastic polymer having



groups, 0.5 to 20 parts by weight of a tackifier, 0.2 to 5 parts by weight, based on 100 parts by weight of the total amount of the synthetic rubber and the thermoplastic polymer, of a novolak resin, and 1 to 50 parts by weight, based on 100 parts by weight of the novolak resin, of a compound capable of providing formaldehyde upon heating at a temperature of not less than the melting point of the thermoplastic polymer but not more than 270° C.;

extruding the resultant mixture from an extruder, followed by taking-off or winding the extruded strand to thereby disperse the thermoplastic polymer in the form of fine fibers in a continuous phase comprising the synthetic rubber; and

grafting the vulcanizable synthetic rubber onto the thermoplastic polymer at the interface of the fine fibers through the novolak resin.

4,602,064

GRAFTED RUBBER CONCENTRATES FOR USE IN IMPACT RESISTANT POLYMERS

Eugene R. Moore, Midland, Mich., and Maxmilian J. deFreitas, Houston, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 30, 1984, Ser. No. 676,683
Int. Cl.[4] C08F 279/02
U.S. Cl. 525—316 **26 Claims**

1. A process for preparing a latex of grafted copolymer particles, the steps of the process comprising:

(a) providing a first generally hydrophobic monomer mixture, said mixture comprising a monovinylidene aromatic monomer, a conjugated diolefin, and an ethylenically unsaturated nitrile monomer;

(b) forming an aqueous suspension by suspending the first generally hydrophobic monomer mixture in an aqueous phase;

(c) adding to the aqueous suspension an amount of hydrophilic monomer, the amount being sufficient to provide a generally hydrophilic surface on a polymer to be prepared from the monomers in the aqueous suspension;

(d) initiating polymerization of the monomers present in the aqueous suspension to form an aqueous suspension of partially polymerized monomers;

(e) providing a second generally hydrophobic monomer mixture, said mixture comprising a monovinylidene aromatic monomer, a conjugated diolefin, and an ethylenically unsaturated nitrile monomer;

(f) adding the second generally hydrophobic monomer mixture to the aqueous suspension of partially polymerized monomers;

(g) providing a graft polymerization base by continuing polymerization of the monomers present in the aqueous suspension of partially polymerized monomers until achieving a conversion of monomer to polymer of at least 50 percent; and

(h) graft polymerizing to the graft polymerization base one or more monomers selected from the group consisting of monovinylidene aromatic monomers, ethylenically unsaturated nitrile monomers, and monoethylenically unsaturated carboxylic acid monomers.

4,602,065

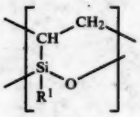
SILICON-CONTAINING STEP LADDER POLYMER AND A PROCESS FOR PRODUCING THE SAME

Shiro Konotsune, Yokosukashi; Hiromi Higashi, Zushishi; Masami Wada, Yokosukashi; Hiroshi Maehara, Yokohamashi, and Kazuyuki Tsuji, Tokyo, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 18, 1984, Ser. No. 651,689
Int. Cl.[4] C08F 8/10
U.S. Cl. 525—326.5 **8 Claims**

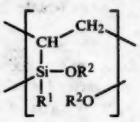
1. A silicon-containing step ladder polymer

(a) comprising repeating units represented by the general formula



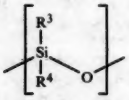
(I)

a unit represented by the general formula



(II)

and a unit represented by the general formula



(III)

where R^1 represents a hydrocarbon group or fluorine-substituted hydrocarbon group, R^2 represents hydrogen or a trialkylsiloxy group, R^3 and R^4 which may be identical or different with each other, represent individually a hydrocarbon group or fluorine-substituted hydrocarbon group,

(b) in the unit (I) the free CH bond is bonded to the free CH_2 bond in other unit (I), the free CH_2 bond in the unit (II), a hydrocarbon residue of a vinyl polymerization initiator, or hydrogen; the free Si bond is bonded to the free O bond in other unit (I), the free R^2O bond in the unit (II) the free O bond of the unit (III) or independent R^2O; the free CH_2 bond is bonded to the free CH bond in other unit (I), the free CH bond in the unit (II), a hydrocarbon residue of a vinyl polymerization initiator or hydrogen; and the free O bond is bonded to the free Si bond in other unit (I), the free Si bond in the unit (II), the free Si bond in the unit (III), or R^2;

(c) in the unit (II), the free CH bond is bonded to the free CH_2 bond in the unit (I); the free Si bond is bonded to the free O bond in the unit (I); and the free CH_2 bond is bonded to the free CH bond in the unit (I); and the free R^2O bond is bonded to the free Si bond in the unit (I), and

(d) a ring structure is constituted by bondings between a free CH_2 bond in the unit (I) and a free CH bond in a next unit (I) and between a free O bond in the unit (I) and a free Si bond in the next unit (I) or by bondings between a free CH_2 bond in a unit (I) and a free CH bond in a next unit (II) and between a free O bond in the unit (I) and a free Si bond in the next unit (II),

(e) in the unit (III), the free Si bond is bonded to the free O bond in the Unit (I), the free O bond in other unit (III), or independent R^2O—; the free O bond is bonded to the free Si bond in the unit (I), the free Si bond in other unit (III), or independent R^2,

(f) the molar ratio of the unit (I) to the unit (II) is between 5:1 and 100:1 and the molar ratio of the unit (III) to the total amount of the unit (I)+unit (II) is between 1:5 and 1–100,

(g) a unit chain of the ladder structure constituted with the units selected from the unit (I) and the unit (II) comprises 5–100 units of said selected units.

4,602,066

COVALENTLY BONDED ABHERENT FOR MOLDED POLYMER SYSTEMS

James E. Schuetz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 29, 1985, Ser. No. 728,412
Int. Cl.[4] C08L *39/00, 25/08*
U.S. Cl. 525—326.7 24 Claims

1. A stable abherent composition comprising a polymer containing a pendent cyclic iminoether group covalently bonded to a long chain fatty acid by a ring opening reaction of said cyclic iminoether group with the carboxyl group present on said fatty acid.

4,602,067

HIGH TEMPERATURE DRILLING FLUIDS

Randel E. Stong, Gales Ferry, and Stanley W. Walinsky, Mystic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 612,280, May 21, 1984, Pat. No. 4,566,978. This application Mar. 28, 1985, Ser. No. 716,908
Int. Cl.[4] C08F *8/32*
U.S. Cl. 525—327.4 4 Claims

1. A partially amidated terpolymer comprising:
(a) maleic anhydride;
(b) styrene; and
(c) acrylic or methacrylic acid;
Wherein the molar ratio of said components (a), (b) and (c) is from about 30:10:60 to about 50:40:10; and
wherein from about 1–42 percent of carboxylic functionality has been converted to amide functionality by treatment with ammonia, ammonium hydroxide or primary or secondary lower alkyl amines having from about 1–5 carbon atoms in each alkyl group;
the weight average molecular weight of said partially amidated terpolymer being from about 500–10,000.

3. A partially amidated copolymer comprising:
(a) maleic anhydride and
(b) acrylic or methacrylic acid;
wherein the molar ratio of said component (a) to said component (b) is from about 25:75 to 75:25; and
wherein from about 0.5–42 percent of carboxylic functionality has been converted to amide functionality by treatment with ammonia, ammonium hydroxide or primary or secondary lower alkyl amines having from about 1–5 carbon atoms in each alkyl group;
the weight average molecular weight of said partially amidated copolymer being from about 500–10,000.

4,602,068

CHLORINATION OF POLYMERS

Klaus Bronstert, Carlsberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,549
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346137
Int. Cl.[4] C08C *19/14;* C08F *8/22*
U.S. Cl. 525—356 5 Claims

1. An process for the chlorination of polymers to achieve random distribution of chlorine in the chlorinated polymer and to provide products having thermal stability and to increase the reaction rate for the reaction of chlorine with the polymer which comprises reacting chlorine with a solid organic polymer which is dissolved or suspended in a halogen containing organic solvent selected from the group consisting of chlorofluorocarbon and chlorofluorohydrocarbon, said reaction being conducted in the presence of a free radical initiator and said solvent containing from about 20% to about 100%, by weight, of phosgene.

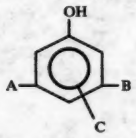
4,602,069

PHENOLIC RESIN-POLYISOCYANATE BINDER SYSTEMS CONTAINING A PHOSPHORUS BASED ACID

William R. Dunnavant, Columbus; John J. Gardikes, Worthington, and Heimo J. Langer, Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 11, 1984, Ser. No. 599,106
Int. Cl.[4] C08G *8/28, 8/32, 18/54, 18/83*
U.S. Cl. 525—504 57 Claims

1. A binder composition provided by mixing and reacting a separately prepared resin component with a hardener component in the presence of a phosphorus based acid having at least one free hydroxyl group attached to the phosphorus atom, said separately prepared resin component including aphenolic resin which comprises reaction products of reacting an aldehyde with a phenol at the two ortho-positions or at one ortho- and the para-position such that said separately prepared resin component contains substantially all of the phenolic hydroxyl groups of said phenol; said phenol having the general formula:



wherein A, B and C are hydrogen atoms, or hydroxyl radicals, or hydrocarbon radicals, or halogen atoms, or combinations of these; said aldehyde having the general formula R'CHO, wherein R' is a hydrogen or a hydrocarbon radical of 1 to 8 carbon atoms; said hardener component comprising a liquid polyisocyanate containing at least two isocyanate groups; said binder composition being immediately curable at room temperature by a separate amine catalyst component; and the amount of said phosphorus based acid being sufficient to extend the bench life of said binder composition in the absence of said catalyst component.

4,602,070

THERMOSETTABLE EPOXY RESINS WITH IMPROVED IMPACT RESISTANCE

Michael B. Cavitt, Lake Jackson, and David J. Duncan, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 2, 1985, Ser. No. 751,159
Int. Cl.[4] C08G *59/62*
U.S. Cl. 525—528 40 Claims

1. An advanced epoxy resin prepared by reacting in the presence of a catalytic quantity of a suitable catalyst (A) a mixture containing (1) at least one polyglycidyl ether of a material containing at least two aliphatic hydroxyl groups per molecule and (2) at least one dicarboxylic acid with (B) at least one material containing two phenolic hydroxyl groups per molecule wherein the components are employed in quantities which provide a ratio of the number of carboxylic acid equivalents to the number of phenolic hydroxyl equivalents to the number of epoxy equivalents of from about 0.08:0.5:1 to about 0.2:0.795:1.

4,602,071
PROCESS FOR THE PRODUCTION OF OLIGOURETHANES CONTAINING MERCAPTO GROUPS AND THEIR USE AS BINDERS FOR COATING AND SEALING COMPOSITIONS HARDENABLE BY OXIDATION AND AS ADDITIVES FOR EPOXIDE RESINS

Wolfgang Wellner; Josef Pedain, both of Cologne, and Hermann Gruber, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,802

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121384

Int. Cl.[4] C08G *59/02;* **C08L** *63/00, 75/08*

U.S. Cl. 525—528 **5 Claims**

1. A process for the production of oligourethanes containing terminal mercapto groups which comprises reacting

(a) 1-isocyanatomethyl-1,3,3-trimethyl -5-isocyanatocyclohexane with

(b) substoichiometric quantities of a polyether polyol having a theoretical molecular weight of about 4000 to 7000 and an average OH-functionality of greater than about 2.5 and

(c) about 0.8 to 1.1 times the equivalent quantity of mercapto ethanol, based on the excess of isocyanate groups arising out of the molar ratio of components (a) to (b) and the hydroxyl groups of component (c).

4,602,072
COLOR IMPROVEMENT OF POLYMER COMPOUNDS AND PRODUCTS MOLDED THEREFROM

Leslie E. Wallace, Midland; Leo F. Rokosz, Linwood, and Charles L. Stacy, Jr., Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 3, 1984, Ser. No. 677,264

Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—77 **17 Claims**

1. A method for improving color purity in polymers and products molded therefrom comprising:

passing the monomer stream first through an alkali metal aluminosilicate molecular sieve bed and then through an activated alumina bed, prior to polymerization.

4,602,073
ADHESIVE COMPOSITIONS

Martin M. Skoultchi, Somerset, and Alfred G. Battaglia, Berkeley Heights, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jun. 7, 1985, Ser. No. 742,488

Int. Cl.[4] C08F *4/00*

U.S. Cl. 526—208 **22 Claims**

1. A curable adhesive composition comprising in combination (a) a first part comprising free radical polymerizable acrylic or substituted acrylic monomer(s) and diazonium salt in an amount sufficient to initiate polymerization of said monomer(s), and in contact therewith (b) a second part comprising an activator to induce the decomposition of said diazonium salt wherein the activator is an aldehyde-amine condensation reaction product.

4,602,074
CONTACT LENS MATERIAL

Yutaka Mizutani; Tatsuo Harata, both of Nagoya, and Naokatsu Tanahashi, Gifu, all of Japan, assignors to Nippon Contact Lens Manufacturing Ltd., Aichi, Japan

Filed Dec. 18, 1984, Ser. No. 682,782

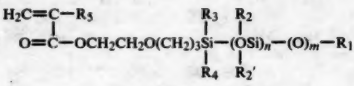
Claims priority, application Japan, Dec. 20, 1983, 58-238978; Aug. 23, 1984, 59-174177

Int. Cl.[4] C08F *220/26;* **G02C** *7/04*

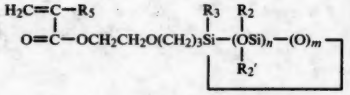
U.S. Cl. 526—245 **5 Claims**

1. An oxygen-permeable hard contact lens material which is a copolymer formed by the reaction of:

(a) an organosiloxane represented by one of the formulae:



or



wherein R_1 is selected from the group consisting of C_1–C_6 alkyl groups and phenyl groups; R_2 and R_2' are selected from the group consisting of C_1–C_6 alkyl groups and phenyl groups; R_3 and R_4 are selected from the group consisting of C_1–C_6 alkyl groups, Phenyl groups and

R_5 is CH_3 or H; m is 0 or 1;
and n is an integer from 1 to 3; and

(b) an ester of C_1–C_{10} monohydroxy or polyhydroxy alcohol and an acid selected from the group consisting of methacrylic acid, acrylic acid and itaconic acid.

4,602,075
MONOMERIC MIXTURE FOR CURED POLYMERIC MATERIAL USED IN ORGANIC GLASS

Yasuji Kida, Kudamatsu; Kaoru Miura, and Ikumi Kawaguchi, both of Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

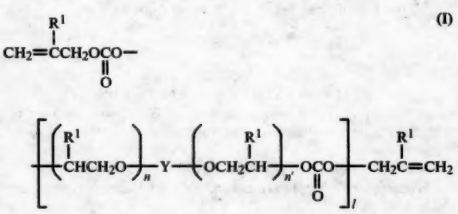
Filed Nov. 13, 1984, Ser. No. 670,602

Claims priority, application Japan, Nov. 11, 1983, 58-211015

Int. Cl.[4] C08F *218/24*

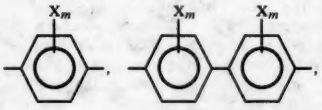
U.S. Cl. 526—293 **10 Claims**

1. A monomeric mixture for a cured polymeric material used as organic glass, said mixture at least comprising an aromatic di(meth)allyl carbonate represented by the following formula (I)



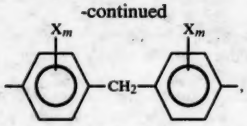
(I)

wherein R^1's are identical or different and each represents a hydrogen atom or a methyl group, Y represents one of the following groups (a) to (g)

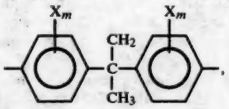


(a) (b)

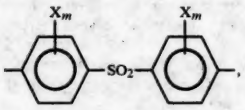
-continued



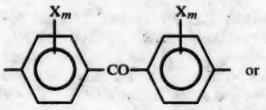
(c)



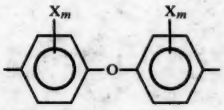
(d)



(e)



(f)

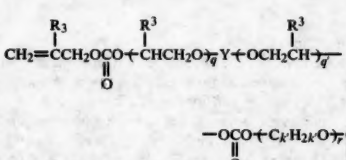


(g)

in which m is a number of 0, 1 or 2 and X's may be identical or different and each represents a bromine or chlorine atom, n and n' are identical or different and each represents a number of 1 to 12 and l is a number of 1 or 2, an aliphatic di(meth)allyl carbonate represented by the following formula (II)

(II)

wherein R^2's are identical or different and each represents a hydrogen atom or a methyl group, k is an integer of 2 to 6, j is a number of 1 to 12, and p is a number of 1 or 2, and a di(meth)allyl carbonate represented by the following formula (III)



(III)

wherein R^3's are identical or different and each represents a hydrogen atom or a methyl group, Y is a group selected from the groups defined for Y in formula (I), k' is a number of 2 to 6, and q, q' and r are identical or different and each represents a number of 1 to 12, the amount of di(meth)allyl carbonate of formula (III) being 0.1 to 10 parts by weight per 10 parts by weight of the aliphatic di(meth)allyl carbonate of formula (II) and the amount of the aromatic di(meth)allyl carbonate of formula (I) is 10 to 100 parts by weight per 10 parts by weight of the aliphatic di(meth)allyl carbonate of formula (II).

4,602,076

PHOTOPOLYMERIZABLE COMPOSITIONS

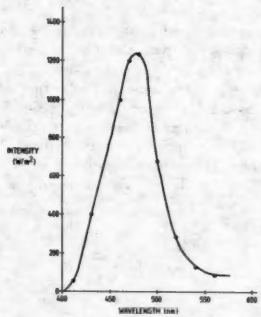
Maurice J. Ratcliffe, Congleton; Derek J. Shaw, Knutsford, and Peter A. Robinson, Chester, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 468,714, Feb. 22, 1983, abandoned. This application Sep. 5, 1985, Ser. No. 772,206

Claims priority, application United Kingdom, Mar. 4, 1982, 8206317

Int. Cl.[4] C08F *20/10*

U.S. Cl. 522—7 **11 Claims**



1. A photopolymerisable composition which comprises at least one ethylenically unsaturated polymerisable monomer, at least one ketone selected from fluorenone and comphorquinone and their substituted derivatives and at least one organic peroxide, said composition being characterized by its improved cure on irradiation with visible light at ambient temperature and in the presence of air.

4,602,077

PLASTIC COPOLYMERS OF PROPYLENE WITH LINEAR DIENES HAVING CONJUGATED DOUBLE-BONDS AND PROCESS FOR PREPARING SAME

Giuliano Cecchin; Floriano Guglielmi, both of Ferrara, and Francesco Zerega, Induno Olona, all of Italy, assignors to HIMONT Incorporated, Wilmington, Del.

Filed Jul. 24, 1985, Ser. No. 758,421

Claims priority, application Italy, Jul. 30, 1984, 22121 A/84

Int. Cl.[4] C08F *10/06*

U.S. Cl. 526—339 **12 Claims**

1. Plastic copolymers of propylene with linear dienes having conjugated double-bonds and optionally with ethylene and/or other alpha-olefins, containing from 0.1 to 15% by weight of diene units, characterized in that the molar ratio between the diene units in 1,2 configuration and the ones in 1,4 configuration is higher than 0.2 and preferably higher than 1.

4,602,078

SILICONE ELASTOMERS AND ADHESION PROMOTER THEREFOR

Edward A. Joseph, Rode-St. Genese, and Brian R. Trego, Vossem, both of Belgium, assignors to Dow Corning, Ltd., Barry, Wales and Dow Corning, S.A., Seneffe, Belgium

Filed Jul. 12, 1985, Ser. No. 754,096

Claims priority, application United Kingdom, Jul. 26, 1984, 8419106; Nov. 13, 1984, 8428669

Int. Cl.[4] C08G 77/04

U.S. Cl. 528—34 9 Claims

1. A composition comprising the product obtained by mixing (A) a silanol-terminated polydiorganosiloxane, (B) a crosslinking agent for (A) which is a silicon compound having in the molecule at least three silicon-bonded groups selected from alkoxy and alkoxyalkoxy groups having less that 6 carbon atoms wherein any remaining silicon-bonded substituents are those composed of carbon and hydrogen atoms, (C) a metal or organometal salt of a carboxylic acid, (D) a silane of the general formula

$$RHNR'Si(OY)_{3-a}X_a$$

wherein R represents a hydrogen atom, an alkyl group having from 1 to 4 inclusive carbon atoms or an aliphatic hydrocarbon group attached to the nitrogen atom through a carbon to nitrogen bond and containing at least one amino group, R' represents an alkylene group having from 3 to 6 inclusive carbon atoms, X represents a monovalent hydrocarbon group having from 1 to 6 inclusive carbon atoms, Y represents an alkyl or alkoxyalkyl group having less than 6 carbon atoms and a has a value of 0 or 1, and (E) a silane of the general formula

$$ZSi(OM)_{3-b}L_b$$

in which Z represents an organic group composed of carbon, hydrogen and oxygen having therein at least one group of the formula

L represents an alkyl group having from 1 to 4 inclusive carbon atoms, or a phenyl group, M represents an alkyl or an alkoxyalkyl group having less than 6 carbon atoms and b has a value of 0 or 1, (D) and (E) being employed in a ratio of from 0.1 to 3 moles of (D) per mole of (E).

4,602,079

URETHANE ELASTOMERS PREPARED USING A PREPOLYMER PREPARED FROM A POLYESTER WHICH REACTS WITH A CHAIN-EXTENDING AGENT AND/OR A SATURATED POLYESTER RESIN IN WHICH AT LEAST ONE OF THE POLYESTERS IS PREPARED FROM A DIMER AND/OR TRIMER FATTY ACID

Gérard Vinches, Louviers, and Line L. Fiquet, Rouen, both of France, assignors to Witco Chemical Corporation, New York, N.Y.

Filed Feb. 21, 1985, Ser. No. 704,030

Claims priority, application France, Feb. 23, 1984, 84 02741

Int. Cl.[4] C08G 18/10

U.S. Cl. 528—60 20 Claims

1. Method for improving the hydrolysis resistance of a substantially saturated urethane elastomer, the said elastomer being prepared by reacting a hydroxy compound with a prepolymer, the weight ratio hydroxy compound/prepolymer being between 5/95 and 95/5, the said hydroxy compound consisting:

either of at least one chain-extending agent;

or of at least one saturated polyester resin in the presence of the usual additives;

or of a mixture of at least one chain-extending agent and at least one saturated polyester resin in the presence of the usual additives;

each chain-extending agent and each saturated polyester resin containing at least two hydroxy end groups, the said prepolymer being prepared by reacting at least one saturated polyester resin containing at least two hydroxy end groups and at least one organic isocyanate of functionality of at least 2, the isocyanate(s) being in molar excess relative to the saturated polyester resin(s), each of the polyester resins being prepared by reacting at least one saturated polyacid with at least one saturated polyol, in which method, to prepare at least one of the saturated polyester resins, a fraction of the saturated polyacid(s) is replaced by at least one polymerized fatty acid consisting essentially of a dimer and/or a trimer, the initial total content of polymerized fatty acid(s) being between 1 and 35% by weight, these percentages being referred to the said substantially urethane elastomer.

4,602,080

ORGANIC SALTS OF POLYISOCYANATE DERIVATIVES AND THE PREPARATION THEREOF

Pierre M. Lambert, Louvain-la-Neuve, and Ignacio De Aguirre-Otegui, Wavre-Limal, both of Belgium, assignors to Societe Carbochimique en abrege "CARBOCHIM", Belgium

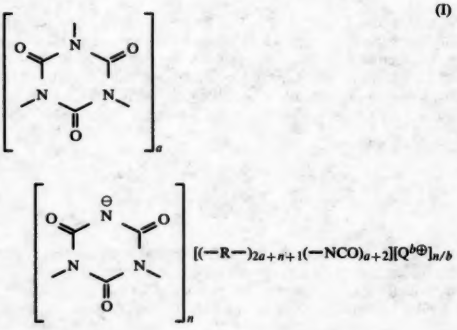
Filed Jun. 27, 1983, Ser. No. 507,639

Claims priority, application Luxembourg, Jun. 29, 1982, 84238

Int. Cl.[4] C07D 403/02, 403/14

U.S. Cl. 528—67 19 Claims

1. An organic salt of a polyisocyanate containing at least one negatively charged isocyanurate ring and at least one positively charged non-metal ion, said salt having the following general formula (I):



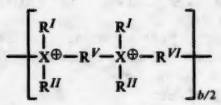
(I)

in which

R is a bivalent radical selected from the group consisting of lower alkylene, lower cycloalkylene, phenylene, naphthylene, stilbene, isophorone and diphenylene-lower alkylene which is or is not substituted by lower alkyl groups;

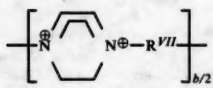
Q is an ammonium, arsonium or phosphonium cation which is tetrasubstituted by identical or different radicals, said tetrasubstituted ammonium, arsonium or phosphonium cation being selected from the group consisting of radicals of the following formulae:

(II)



(III)

and



(IV)

in which

X is nitrogen, phosphorus or arsenic;

R^I, R^{II}, R^{III} and R^{IV} which are identical or different represent a lower alkyl, phenyl, phenyl-lower alkyl or phenylene di-lower alkyl radical, whereby R^{IV} may represent a polyvalent radical and two or three of R^I, R^{II}, R^{III} and R^{IV} may be joined to form with one or two nitrogen atoms a di-lower alkyl piperidinium radical, a lower alkyl pyridinium radical or a di-lower alkyl triethylene diammonium radical.

R^V and R^{VI} which are identical or different represent a lower alkylene or phenyl di-lower alkylene radical; and

R^{VII} represents a lower alkylene radical or mixtures of said cations;

a is the average number of molecular isocyanurate rings which may be equal to zero or have a value from 1 to 500;

b is the number of tetrasubstituted heteroatoms of Q having a value from 1 to 100, and

n is the average number of ionic isocyanurate rings having a value from 1 to about 3000.

4,602,081

FIRE RESISTANT POLYAMIDE BASED ON 1-[(DIORGANOOXYPHOSPHONYL)METHYL]-2,4- AND -2,6- DIAMINO BENZENE

John A. Mikroyannidis, Patras, Greece, and Demetrius A. Kourtides, Gilroy, Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

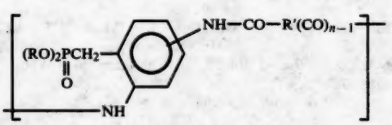
Continuation-in-part of Ser. No. 522,629, Aug. 12, 1983, abandoned. This application Aug. 16, 1984, Ser. No. 641,153

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.⁴ C08G *69/42*

U.S. Cl. 528—337 **20 Claims**

1. A polymer having the recurring unit:



wherein the R groups are independently selected from alkyls, substituted alkyls or aryls and the second NH is in the 4-position, the 6-position or both the 4-position and the 6-position relative to the phosphonyl methyl group; R' is a hydrocarbon bridging group and n is 2.

4,602,082

PROPYLENE-BASE RANDOM COPOLYMER PARTICLES AND PRODUCTION PROCESS THEREOF

Hiroyuki Akiyama, Hiratsuka; Susumu Izawa, Utsunomiya, and Hideki Kuwabara, Hadano, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,431

Claims priority, application Japan, Mar. 20, 1985, 60-57454

Int. Cl.⁴ C08F *6/00*; C08J *9/18*

U.S. Cl. 528—481 **12 Claims**

1. A process for producing propylene-base random copolymer particles suitable for use in the production of pre-foamed particles, which comprises:

charging starting propylene-base random copolymer particles together with a dispersing medium in a vessel;

heating with stirring the contents to a temperature of the crystallization temperature of the starting copolymer particles or higher; and

releasing the thus-heated starting copolymer particles and dispersing medium out of the vessel into a medium at a temperature of (the crystallization temperature −30° C.) or lower so as to quench the thus-heated starting copolymer particles.

4,602,083

COAGULATION PROCESS

Ju-Ming Hung, Holland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 10, 1985, Ser. No. 690,227

Int. Cl.⁴ C08F *6/22*

U.S. Cl. 528—488 **22 Claims**

1. A process for the coagulation of an aqueous polymer latex comprising contacting the aqueous polymer latex with an effective amount of an aqueous solution of a water soluble non-nucleophilic, non-oxidative salt of an alkaline earth metal and removing the coagulated polymer from the aqueous medium.

4,602,084

MONOAZO DYES CONTAINING A 4-SUBSTITUTED-2-AZO-1,1'-DIPHENYLSULFONE COMPONENT

Rudolf Hurter, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

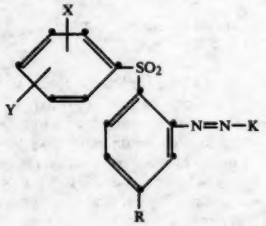
Filed Jul. 8, 1983, Ser. No. 512,089

Claims priority, application Switzerland, Jul. 19, 1982, 4397/82

Int. Cl.⁴ C09B *29/01, 29/033, 29/036, 62/006*

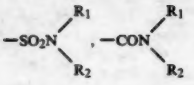
U.S. Cl. 534—641 **7 Claims**

1. A monoazo dye of the formula

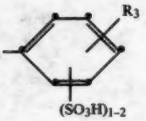


(I)

in which K is an aminobenzene, alkoxybenzene, aminonaphthalene, alkoxynaphthalene, naphthol, aminonaphthol, pyrazolone, aminopyrazole, pyridone pyrimidine, indole, naphthimidazole, diphenylamine, pyrazolo[2,3-a]pyrimidine, tetrahydroquinoline or acetoacetamide radical, and R is



—CO—R_2 or —SO_2—O—R_2 in which R_1 is hydrogen or C_{1-4}-alkyl and R_2 is monosulfo-C_{1-12}-alkyl which is unsubstituted or substituted by halogen, hydroxyl, cyano, C_{1-4}-alkoxy, C_{1-6}-alkanoyl or benzoyl, or a radical of the formulae



(2)

or

(3)

where R_3 in the formulae (2) and (3) is hydrogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{2-6}-alkanoylamino or carboxyl, and X and Y, independently of each other, are hydrogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{2-6}-alkanoylamino, C_{1-5}-alkylsulfonylamino, phenyl which is unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoyl amino, hydroxyl or carboxyl, or phenoxy which is unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino, hydroxyl or carboxyl.

4,602,085

CATALYTIC PROCESS FOR THE PRODUCTION OF HYDROXYAMINE DERIVATIVES OF ALPHA METHYL GLUCOSIDE

Roger G. Duranleau, Georgetown, and Michael E. Brennan, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,309
Int. Cl.[4] C07H *17/04, 15/04*
U.S. Cl. 536—17.2 **4 Claims**

1. An amine derivative of alpha methyl glucoside propoxylated with from about 3 to about 7 moles of propylene oxide per mole of alpha methyl glucoside, said derivative having been prepared by reductively aminating said propoxylated alpha methyl glucoside in the presence of a reductive amination catalyst and in the presence of about 1 to 25 moles of hydrogen and about 4 to about 30 moles of ammonia per mole of said propoxylated alpha methyl glucoside at a temperature within the range of about 210° to about 235° C. and a pressure within the range of about 200 to about 5000 psig. whereby from about 45 to about 90% of the original OH groups of the propoxylated alpha methyl glucoside are converted to NH_2 groups, of which amine groups, about 70 to about 90% are primary amine groups.

4,602,086

METHOD OF PRODUCING SOLUTION CONTAINING D-RIBOSE

Namikiri Hiroshi, Funabashi; Tobe Takeshi, and Hattori Masahiko, both of Tokyo, all of Japan, assignors to Tokyo Tanabe Company, Limited, Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,272
Claims priority, application Japan, Oct. 13, 1983, 58-189976; Nov. 29, 1983, 58-223187
Int. Cl.[4] C07H *1/00*
U.S. Cl. 536—125 **12 Claims**

1. A method of producing a solution containing D-ribose from a solution containing D-arabinose, which comprises epimerizing D-arabinose dissolved in a solvent to D-ribose, in the conjoint dissolved presence of a molybdic acid ion and a boric acid compound.

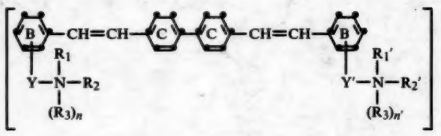
4,602,087

DISTYRYLBIPHENYLS

Christian Lüthi, Basel; Hans R. Meyer, Binningen, and Kurt Weber, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 372,779, Apr. 28, 1982, Pat. No. 4,468,352, which is a division of Ser. No. 137,147, Apr. 4, 1980, Pat. No. 4,339,393. This application May 18, 1984, Ser. No. 611,819
Claims priority, application Switzerland, Apr. 11, 1979, 3478/79; Jun. 26, 1979, 5952/79
The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.
Int. Cl.[4] C07C *141/02, 93/02;* **C07D** *211/00, 207/06*
U.S. Cl. 544—78 **6 Claims**

1. A distyrylbiphenyl of the formula



$$(n + n')^{\oplus}$$
$$(n + n')\,A^{\ominus}$$

in which Y and Y′ independently of one another are C_{1-20}-alkylene or C_1–C_{20}-hydroxyalkylene, R_1, R_1', R_2 and R_2' independently of one another are C_{1-8}-alkyl or C_{3-4}-alkenyl, R_3 is hydrogen, C_{1-4}-alkyl or C_{3-4}-alkenyl, or R_1 and R_2 or R_1' and R_2' together with the N atom to which they are attached, is pyrrolidine, piperidine, hexamethyleneimine or morpholine, or R_1 and R_2, or R_1' and R_2', together with R_3 and the N atom to which they are attached, are pyridine or picoline, A^- is a colorless anion and n and n′ independently of one another are 0 or 1, the benzene rings B and C can also be substituted by halogen, C_{1-4}-alkyl, C_{3-4}-alkenyl or C_{1-3}-alkoxy, and the benzene rings B can also be substituted by a trimethylene or tetramethylene group.

4,602,088

PREPARATION OF ENAMINES FROM CONJUGATED DIENES

Jiang-Jen Lin, Round Rock, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 26, 1984, Ser. No. 634,925
Int. Cl.[4] C07C *85/08;* **C07D** *295/02*
U.S. Cl. 544—178 **7 Claims**

1. A method for preparing an enamine having conjugated olefinic unsaturation which comprises reacting a conjugated diene with a secondary amine, hydrogen and carbon monoxide at a temperature within the range of about 20° to about 150° C. and a pressure within the range of about 100 to about 5000 psig,

in organic solvent solution in the presence of rhodium carbonyl catalyst complexed with a phoshine ligand.

4,602,089

PROCESS FOR PREPARING PURINE COMPOUNDS

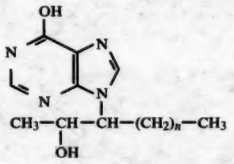
Lionel N. Simon, Santa Ana, Calif.; Hans-Rudolf Mueller, and Hans Zutter, both of Schaffhausen, Switzerland, assignors to Newport Pharmaceuticals, Inc., Newport Beach, Calif.

Division of Ser. No. 357,679, Mar. 12, 1982, Pat. No. 4,451,728. This application Feb. 21, 1984, Ser. No. 582,229

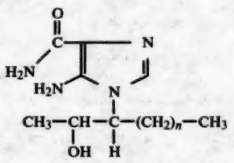
Int. Cl.[4] C07D *473/02*; A61K *31/52*

U.S. Cl. 544—265 **14 Claims**

1. A process of preparing a compound of the formula



comprising reacting a compound of formula (1)



with an equimolar amount of a lower alkyl orthoformate formic acid in the presence of acetic anhydride.

4,602,090

POLYMETHYLENE PYRROLES

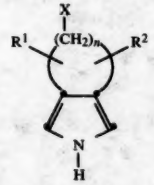
Lee Traynor, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 494,752, May 16, 1983, Pat. No. 4,487,667. This application Dec. 10, 1984, Ser. No. 679,846

Int. Cl.[4] C07D *401/06, 209/52*

U.S. Cl. 546—272 **3 Claims**

1. A substituted pyrrole having the structure

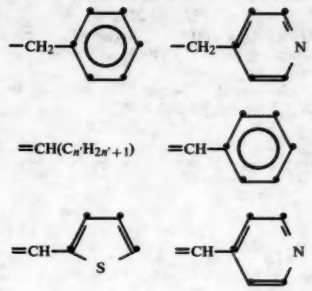


wherein,

n is an integer chosen from 3 to 4, so that at least one C atom carrying the substituent in the polymethylene ring is not adjacent to the 3- and 4- C atoms on the pyrrole ring;

R^1 and R^2, if present, are independently selected from phenyl, hydroxyphenyl, cycloalkyl having from 4 to 7 carbon atoms, lower alkyl, alkoxy and hydroxyalkyl each having from 1 to about 6 carbon atoms, and each substituent may be on the same C atom, or different C atoms, and both R^1 and R^2 cannot be on C atoms adjacent to the 3- and 4- C atoms of the pyrrole ring; and,

X, if present, is selected from the group consisting of



and fluorenylidene; n' is 2 to 4.

4,602,091

PRODUCTION OF ETHYLENEDIAMINE AND N-AMINOETHYLPIPERAZINE FROM PIPERAZINE

Michael E. Brennan, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 25, 1984, Ser. No. 573,773

Int. Cl.[4] C07D *241/04*

U.S. Cl. 544—402 **10 Claims**

1. A method for the production of ethylenediamine and N-aminoethylpiperazine from piperazine which comprises contacting a feedstock consisting essentially of piperazine with a reductive amination catalyst under reductive amination conditions including a temperature within the range of about 150° to about 250° C. and a pressure of from about 0 to about 5000 psig in the presence of excess hydrogen and from about 1 to about 12 mols of ammonia per mole of piperazine, for a contact time for said reductive aminations conditions of temperature and pressure correlated to provide for a conversion of the piperazine of not more than about 30%, whereby a piperazine conversion product is obtained containing ethylenediamine and N-aminoethylpiperazine as the principle reaction products with only minor by-product and residue formation, said reductive amination catalyst consisting essentially of nickel or cobalt and copper and chromia.

6. A method for the production of ethylenediamine and N-aminoethylpiperazine from piperazine which comprises the steps of contacting a feedstock consisting essentially of piperazine with a reductive amination catalyst under reductive amination conditions including a temperature within the range of about 180° to about 230° C., and a pressure within the range of about 1000 to about 3000 psig in the presence of excess hydrogen and from about 4 to about 8 mols of ammonia per mole of piperazine, for a contact time for said reductive amination conditions of temperature and pressure correlated to provide for a conversion of the piperazine of not more than about 30%, whereby a piperazine conversion product is obtained containing ethylenediamine and N-aminoethylpiperazine as the principle reaction products with only minor by-product and residue formation, said reductive amination catalyst consisting essentially of nickel or cobalt and copper and chromia.

4,602,092

METHOD FOR MAKING PHOSPHINIC ACID INTERMEDIATES

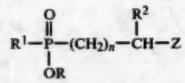
John K. Thottathil, Trenton, and Jerome L. Moniot, Chester, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 533,485, Sep. 19, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,418

Int. Cl.[4] C07F *9/32*

U.S. Cl. 548—112 **17 Claims**

1. A method for preparing a phosphinic acid intermediate of the structure



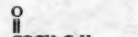
wherein

R is H or lower alkyl;

R^1 is lower alkyl, aryl, arylalkyl, cycloalkyl, or cycloalkylalkyl;

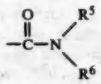
R^2 is H or lower alkyl;

Z is H, lower alkyl,



$-(CH_2)_4C_6H_5$, $-CO_2R^3$ (wherein R^3 is H or lower alkyl),

(wherein R^4 is H, lower alkyl, aryl or arylalkyl), —CN, or

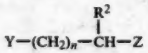


wherein R^5 and R^6 may be the same or different and are selected from the group consisting of H, lower alkyl, aryl, aryl-lower alkyl, cycloalkyl or cycloalkylalkyl and at least one of R^5 and R^6 is other than H, or R^5 and R^6 can be taken with the N-atom to form a 5-, 6- or 7-membered heterocyclic ring which 5-, 6- or 7-membered N-containing ring may or may not contain a CO_2R^3 group and which 5- or 6-membered N-containing ring may or may not be fused to an aryl ring; and

n is 0 or 1,

which comprises reacting a phosphonous acid or ester thereof of the structure

wherein R and R^1 are as defined above with an alkylating agent of the structure



wherein Y is a leaving group, and R^2, n and z are as defined above, employing a molar ratio of phosphonous acid or ester thereof to the alkylating agent of within the range of from about 0.5:1 to about 10:1, in the presence of a silylating agent, employing a molar ratio of phosphonous acid or ester to silylating agent of within the range of from about 0.06:1 to about 2:1, and in the presence of an inert organic solvent to form the phosphinic acid intermediate and separating the phosphinic acid intermediate from the reaction mixture.

4,602,093

NOVEL SUBSTITUTED IMIDAZOLES, THEIR PREPARATION AND USE

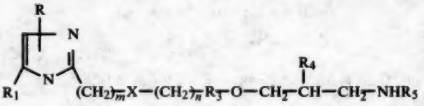
John J. Baldwin, Gwynedd Valley; Gerald S. Ponticello, Lansdale, and Marcia E. Christy, Perkasie, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 8, 1984, Ser. No. 578,145

Int. Cl.[4] C07D *409/10, 233/64*

U.S. Cl. 548—336 **12 Claims**

1. A compound having the formula:



R and R_1 are independently:

hydrogen;

C_1–C_8 linear or branched alkyl;

fluoro, bromo, chloro;

heteroaryl groups having 5-ring atoms selected from furyl, thienyl and N—C_1–C_8-lower alkylpyrrolyl; carboalkoxy wherein the alkyl group has up to 8 carbon atoms;

CF_3;

carbamoyl;

cyano;

wherein R_a is hydrogen or C_1–C_8 alkyl;

unsubstituted or substituted aryl of C_6 having 1–5 substituents selected from fluoro, bromo, chloro, C_1–C_8 linear or branched alkly, or C_1–C_8 alkoxy; heteroaryl groups having 6-ring atoms selected from pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl;

R_2 is hydrogen; C_1–C_8 linear or branched alkyl;

R_3 is unsubstituted or substituted arylene of C_6 or C_{10} having 1–2 substituents selected from halo, C_1–C_8 alkoxy, alkenyloxy having up to 8 carbon atoms;

C_1–C_8 linear or branched alkyl;

cyano,

wherein R_a is as defined above;

R_4 is hydroxy;

R_5 *L is C3*–C_5 cycloalkyl;

C_1–C_8 linear or branched alkyl;

unsubstituted or substituted aralkyl wherein the alkyl is linear or branched C_1–C_8 and the aryl is C_6–C_{10} having 1–2 substituents selected from C_1–C_8 alkoxy, hydroxy, fluoro, bromo, chloro, C_1–C_8 alkyl; heteroaryl having 6-ring atoms containing 1–2N heteroatoms;

X is oxygen or CH_2; and,

m an n are independently 0–2 provided that at least one of m or n is 1.

4. A compound according to claim 1 which is (S)-2-[p-(3-t-

butylamino-2-hydroxypropoxy)phenyl-methyl]-4-(2-thienyl-)imidazole.

4,602,094

PROCESS FOR PREPARING AMIDOSILANES AND AMIDOSILOXANES

Tyrone D. Mitchell, Albany, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Sep. 4, 1985, Ser. No. 772,285
Int. Cl.[4] C07F *7/02, 7/10*
U.S. Cl. 548—406 15 Claims

1. A process for preparing amidosilanes and amidosiloxanes comprising reacting:

(a) an Si—H containing compound and

(b) an organic amide in the presence of

(c) a precious metal containing catalyst.

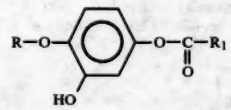
4,602,095

3-HYDROXY-4-ALKYLOXYPHENYL HETEROCYCLIC AROMATIC CARBOXYLATES

Paul R. Zanno, Port Chester; Ronald E. Barnett, Suffern, and Jed A. Riemer, Scarsdale, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,633
Int. Cl.[4] C07D *207/00, 333/38, 307/02;* A23L *1/236*
U.S. Cl. 548—532 10 Claims

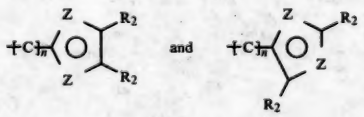
1. A compound of the formula:



wherein

R is selected from the group consisting of methyl and ethyl;

R_1 is selected from the group consisting of:



wherein

n is an integer from 0 to 1;

each Z is selected from the group consisting of S, O NR_2, N and CR_2 with the provisio that at least one Z is a hetero atom and a further provisio that NR_2 is not a NH group; and

each R_2 is selected from the group consisting of H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $CH(CH_3)$hd 2, OH, OCH_3, OCH_2CH_3, $OCH(CH_3)_2$, CH_2OH, CH_2CH_2OH, $CH_2CHOHCH_3$, CH_2 OCH_3, CHO, $CHOCH_3$, $CHOCH_2CH_3$, CH_2COCH_3COOH and $COOCH_3$ with R_1 containing no more than 12 carbon atoms; and salts thereof.

4,602,096

PROCESS FOR THE RACEMIZATION OF N-ACETYL-D,L-α-AMINOCARBOXYLIC ACIDS

Michael Karrenbauer, Moos-Bankholzen, and Axel Kleemann, Mühlheim, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,993
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435095
Int. Cl.[4] C07D *209/20;* C07B *55/00*
U.S. Cl. 548—498 9 Claims

1. A process for the racemization of an N-acetyl-D(L)-α-aminocarboxylic acid comprising heating a melt of the aminocarboxylic acid at an elevated temperature with 0.1 to 2 weight percent of acetic anhydride based on the N-acetyl-D(L)-α-aminocarboxylic acid and then heating it for a residence time, in minutes, to a temperature between 115° and 210° C. wherein the melting temperature of the N-acetyl-D(L)-α-aminocarboxylic acid is the lower limit of the heating temperature T, in °C., and the heating temperature and residence time are correlated by the relationship:

$$T=\ln\left(e^{-50\tau+215}+e^{-5/3\tau+155}\right)$$

and quenching the melt after the end of the residence time with an aqueous alkali metal hydroxide or ammonia solution.

4,602,097

WATER SOLUBLE PHOTOINITIATOR BENZOPHENONE AND THIOXANTHENONE ETHOXY-ETHER DERIVATIVES

John R. Curtis, Lawrenceville, N.J., assignor to Ulano Corporation, Brooklyn, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,604
Int. Cl.[4] C07D *335/16, 409/12, 49/786*
U.S. Cl. 549—27 16 Claims

1. A water-soluble photoinitiator of the formula

$$G—O—(CH_2\,CH_2\,O)_n—CH_2\,CH_2—O—Q$$

wherein:

G is a photoinitiator moiety selected from the group consisting of benzophenone, thioxanthenone and substituted derivatives of benzophenone and thioxanthenone, where the substituent is selected from the group consisting of alkyl, alkoxy, alkylthio, halogeno, nitro, amino, alkylamino, dialkylamino, alkanoyl, alkanoylamino, benzoylamino, and sulfonamido, wherein the alkyl group in the alkyl per se or in alkoxy, alkylthio, alkylamino, dialkylamino, alkanoyl, or alkanoylamino contains from 1 to 4 carbon atoms and may be straight chained or branched,

n has a value of at least 10, and

Q is G or a lower alkyl having from 1 to 4 carbon atoms, with the proviso that when Q is G,

n has a value of at least 19.

4,602,098

PROCESS FOR SEPARATION OF TOCOPHEROL HOMOLOGUES (I)

Charles H. Foster, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 22, 1985, Ser. No. 736,905
Int. Cl.[4] C07D *311/72*
U.S. Cl. 549—413 6 Claims

1. A process for separating tocopherol homologues which comprises reacting a mixed α-, β-, γ, and δ-tocopheryl ester mixture with at least one alcohol of the group consisting of methanol, ethanol and propanol at a temperature of about 180° C. to about 250° C. to deacylate tocopheryl esters other than the α-tocopheryl esters and separating the α-tocopherol ester from the deacylated homologues.

4,602,099

ANTIRHINOVIRUS AGENTS

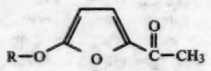
Roger A. Parker, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 955,689, Oct. 30, 1978, abandoned, and Ser. No. 202,968, Nov. 3, 1980, abandoned, which is a division of Ser. No. 955,689, , which is a continuation-in-part of Ser. No. 751,139, Dec. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 347,232, Apr. 2, 1973, Pat. No. 4,000,164, Ser. No. 587,117, Jun. 16, 1975, Pat. No. 4,032,647, and Ser. No. 619,305, Oct. 3, 1975, Pat. No. 4,011,334. This application Sep. 16, 1982, Ser. No. 418,857

Int. Cl.[4] C07D *307/58*

U.S. Cl. 549—479 7 Claims

1. A compound of the formula



wherein R is a straight or branched saturated hydrocarbon chain having from 12 to 16 carbon atoms or a straight or branched unsaturated hydrocarbon chain having from 12 to 16 carbon atoms and from 1 to 4 double bonds.

4,602,100

ORGANO METALLIC COMPLEXES AND THE USE THEREOF IN EPOXIDATION OF OLEFINS

Raymond L. Kelly, Swanland, England, assignor to BP Chemicals Limited, London, England

Filed Oct. 16, 1984, Ser. No. 661,355

Claims priority, application United Kingdom, Oct. 18, 1983, 8327810

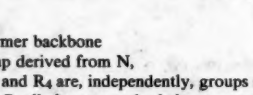
Int. Cl.[4] C07D *303/04, 301/06*

U.S. Cl. 549—529 12 Claims

1. A process for the epoxidation of an olefin which process comprises reacting an olefin with a hydroperoxide in an oxidation stable organic solvent at a temperature in excess of 50° C., characterised in that the reaction is carried out in the presence of, as catalyst, an effective amount of a polymer bound organometallic complex

comprising a metal selected from molybdenum and vanadium,

and a functionalised organic polymer of the formula



wherein

X is a polymer backbone

Y is a group derived from N,

R_1, R_2, R_3 and R_4 are, independently, groups selected from H, a C_1–C_4 alkyl group and a halogen atom,

R_5 and R_6 are, independently, groups selected from H, a C_1–C_4 alkyl group and a halogen atom, or together with the nitrogen atom form part of a heterocyclic ring containing 5 or 6 atoms with nitrogen being the only heteroatom,

R_7 and R_8 are, independently, groups selected from H, a C_1–C_4 alkyl group, and a halogen atom, and each of n and m have a value from 0 to 10,

such that the metal is complexed with the functionalised organic polymer through the nitrogen atom in the $N(R_5)(R_6)$ group and the oxygen atom in $C(R_7)(R_8)OH$ group.

4,602,101

METHOD OF MANUFACTURING ALKYLHALOSILANES

Roland L. Halm, Madison, Ind.; Oliver K. Wilding, Jr., Louisville, and Regie H. Zapp, Carrollton, both of Ky., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 12, 1985, Ser. No. 797,372

Int. Cl.[4] C07F *7/16;* B01J *23/72*

U.S. Cl. 556—472 28 Claims

1. A method for controlling a process for the manufacture of alkylhalosilanes said process comprising, contacting an alkylhalide with metallurgical grade silicon, at a temperature of 250° C. to 350° C., in the presence of tin or tin compounds, and copper or copper compounds, wherein there is at least also present, 25 to 2500 parts per million based on the silicon in the reacton mass, of a promoter selected from the group consisting essentially of

(I) elemental phosphorous;

(II) metal phosphides and,

(III) compounds capable of forming metal phosphides in the reaction mass of the process.

4,602,102

PRODUCTION OF ALKYL GLYCOLATES

Ernest L. Yeakey, and John R. Sanderson, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,546

Int. Cl.[4] C07C *69/675*

U.S. Cl. 560—179 6 Claims

1. A method for the preparation of an alkyl glycolate which comprises reacting dimethoxymethane with formaldehyde under non-acidic conditions in the presence of an orgnic peroxode.

4,602,103

PROCESS FOR THE OXIDATION OF BUTENES TO LINEAR ACETATES

James E. Lyons, Wallingford, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 664,566, Oct. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 559,139, Dec. 7, 1983, abandoned. This application Apr. 10, 1985, Ser. No. 721,627

Int. Cl.[4] C07C *67/05*

U.S. Cl. 560—243 28 Claims

1. A process for the production of butene acetates and linear butene -1,4- diacetates which comprises first activating a supported palladium metal catalyst by contacting it with a C_3–C_6 olefin at a temperature of greater than about 50° C. for a period of time sufficient to provide at least a small but perceptible quantity of said activated catalyst, in the substantial absence of oxygen, and thereafter contacting the activated catalyst with acetic acid and cis-butene-2, trans-butene-2, or butene-1 admixed with air or oxygen in a liquid medium, thereby forming the corresponding butene acetates and linear butene-1,4-diacetates.

4,602,104

CATALYTIC OXIDATION OF PROPYLENE TO ALLYL ACETATE

James E. Lyons, Wallingford, and George Suld, Springfield, both of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 664,565, Oct. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 559,140, Dec. 7, 1983, abandoned. This application Apr. 10, 1985, Ser. No. 722,094

Int. Cl.[4] C07C *67/05*

U.S. Cl. 560—243 30 Claims

1. A process for the preparation of allyl acetate which comprises first activating a supported palladium metal catalyst by contacting it with a C_3–C_6 olefin at a temperature of greater

than about 50° C. for a period of time sufficient to provide at least a small but perceptible quantity of said activated catalyst, in the substantial absence of oxygen, and thereafter contacting the activated catalyst with acetic acid and propylene admixed with air or oxygen in a liquid medium, thereby forming allyl acetate.

4,602,105

PROCESS FOR THE PREPARATION OF ALPHA-HALOALKYL ESTERS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 26, 1984, Ser. No. 593,062
Claims priority, application United Kingdom, May 20, 1983, 8314001
Int. Cl.[4] C07C *67/14, 67/36, 69/003, 69/007*
U.S. Cl. 560—266 24 Claims

1. A process for the preparation of alpha-haloalkyl esters, characterized in that an acylhalide having the general formula

(I)

in which R^1 represents a hydrocarbyl group containing 1–20 carbon atoms and Hal represents chlorine or bromine is contacted with hydrogen at a temperature from about 50° to about 250° C. and pressure from about 5 to about 1000 bar in the presence of a Group VIII element catalyst comprising a homogeneous palladium catalyst, a heterogeneous palladium catalyst, a homogeneous rhodium catalyst or a homogeneous ruthenium catalyst.

4,602,106

PROCESS FOR PRODUCING HYDROXYALKYLAMINOACETIC ACIDS

Alain Blanc, Paris, France, assignor to Societe Francaise Hoechst, Puteaux, France

Filed Mar. 20, 1985, Ser. No. 713,798
Claims priority, application France, Mar. 26, 1984, 84 04656
Int. Cl.[4] C07C *99/00*
U.S. Cl. 562—444 8 Claims

1. A process for producing hydroxyalkylaminoacetic acid of the formula (I):

$$R—CHOH—CHR_1—NR_2—CH_2—COOH \quad (I)$$

wherein

R is hydrogen, C_1–C_{18} alkyl or phenyl which is optionally substituted by at least one radical selected from the group consisting of halogen, C_1–C_4 alkyl and C_1–C_4 alkoxy;

R_1 is hydrogen or C_1–C_4 alkyl;

R_2 is hydrogen, C_1–C_{18} alkyl or the radical R'—CHOH—CHR_1 in which R' is hydrogen or C_1–C_{18} alkyl, and R_1 has the meaning given above;

said process comprising hot reacting, in the absence of catalyst, an aqueous solution of glyoxal with a secondary hydroxylate amine having the formula (III):

$$R_2NH—CHR_1—CHOHR \quad (III)$$

in which R, R_1 and R_2 have the meaning given above.

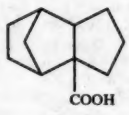
4,602,107

PROCESS FOR PRODUCING TRYCYCLO[5.2.1.$0^{2,6}$]DECANE-2-CARBOXYLIC ACID

Yoshiaki Fujikura, Ichikaimachi; Naotake Takaishi, and Yoshiaki Inamoto, both of Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

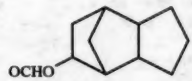
Filed Jul. 18, 1983, Ser. No. 515,022
Claims priority, application Japan, Jul. 22, 1982, 57-128235
Int. Cl.[4] C07C *51/09, 61/12*
U.S. Cl. 562—499 3 Claims

1. A process for producing tricyclo-[5.2.1.$0^{2,6}$]decane-2-carboxylic acid of the formula



(I)

wherein tricylco[5.2.1.$0^{2,6}$]dec-8-yl formate represented by the formula (II):



is contacted with an inorganic strongly acidic catalyst which is at least one member selected from the group consisting of sulfuric acid, phosphoric acid, hydrofluoric acid, boron trifluoride-phosphoric acid, boron trifluoride hydrate, boron trifluoride-methanol and mixture thereof.

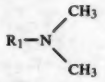
4,602,108

ALKYL AMINE COLOR INHIBITOR

Bonnie G. McKinnie, Magnolia, Ark., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 1, 1984, Ser. No. 636,624
Int. Cl.[4] C07C *85/26*
U.S. Cl. 564—2 6 Claims

1. A color stabilized aliphatic amine composition wherein said amine has the formula:



wherein R_1 is a primary alkyl group containing about 6–30 carbon atoms, said composition containing a color suppressing amount of an additive selected from the group consisting of nitrilotris methylenephosphonic acid, salts of nitrilotris methylenephosphonic acid and mixtures thereof.

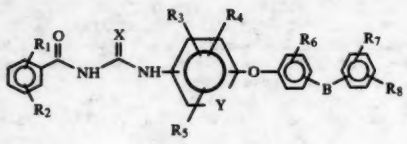
4,602,109

NOVEL PESTICIDAL PHENOXYPHENYL AND PHENOXYPYRIDYL BENZOYL UREAS AND PROCESS FOR PREPARATION

David T. Chou; John A. Durden, both of Raleigh, and Themistocles D. J. D'Silva, Chapel Hill, all of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 454,849, Dec. 30, 1982, Pat. No. 4,540,578.
This application Dec. 27, 1984, Ser. No. 686,735
Int. Cl.[4] C07C *143/833, 157/12, 127/22*
U.S. Cl. 564—23 22 Claims

1. A compound of the formula:



wherein:

X is oxygen or sulfur;

Y is CR_3;

B is oxygen, sulfur, sulfinyl, sulfonyl, oxysulfonyl, sulfonyloxy or carbonyl;

R_1 and R_2 are independently hydrogen, halogen, methoxy, alkyl (C_1–C_4) or trifluoromethyl;

R_3, R_4, R_5 are independently hydrogen, methoxy, halogen, alkyl (C_1–C_4) or trifluoromethyl;

R_6 is hydrogen, halogen or alkyl (C_1–C_4) or trifluoromethyl;

R_7, R_8 are independently hydrogen, halogen, alkyl (C_1–C_4), trifluoromethyl, alkylthio (C_1–C_4), alkylsulfinyl (C_1–C_4), alkylsulfonyl (C_1–C_4), or R_7 and R_8 can optionally be a substituted arylthio, a substituted arylsulfonyl, or a substituted arylsulfinyl, wherein said optional substituents are alkyl (C_1–C_4) or halogen and provided that when B is oxygen, and Y is CR_3, at least two of R_3–R_5 are other than hydrogen.

4,602,110
METHOD OF PURIFYING 3-CHLORO-2-HYDROXYPROPYL TRIALKYLAMMONIUM CHLORIDE

Emmett L. Tasset, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 15, 1985, Ser. No. 734,311
Int. Cl.[4] C07C *89/04*
U.S. Cl. 564—292 **18 Claims**

1. A method of purifying 3-chloro-2-hydroxypropyl trialkylammonium chloride, comprising the steps of:

(a) preparing an aqueous slurry of 3-chloro-2-hydroxypropyl trialkylammonium chloride containing impurities, said slurry having a total solids content of from about 70 to about 98 percent by weight of said slurry;

(b) mixing therewith a water-miscible alcohol having about 3–4 carbon atoms to form a water-alcohol slurry; and

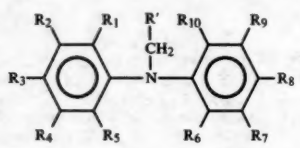
(c) collecting precipitated solids from said water-alcohol slurry.

4,602,111
POLYBROMO TERTIARY AMINE

Kenneth J. Sienkowski, Downers Grove, and Ralph B. Thompson, Oakbrook, both of Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 422,241, Sep. 23, 1982. This application Dec. 29, 1983, Ser. No. 566,744
Int. Cl.[4] C07C *87/50, 87/54*
U.S. Cl. 564—433 **24 Claims**

1. A compound represented by the structural formula:



wherein:

a. R′ is hydrogen, alkyl, alkenyl, phenylalkyl or phenyl; and

b. R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, and R_{10} are each independently hydrogen or a substituent, with the provisos that at least three of R_1, R_2, R_3, R_4, and R_5 are bromo and that at least three of R_6, R_7, R_8, R_9, and R_{10} are bromo.

4,602,112
ZEOLITE H-ZK-5 AS CATALYST FOR CONVERSION OF METHANOL AND AMMONIA TO DIMETHYLAMINE

Thurman E. Gier; Robert D. Shannon, both of Chadds Ford, Pa., and George C. Sonnichsen, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 16, 1984, Ser. No. 672,488
Int. Cl.[4] C07C *65/00*
U.S. Cl. 564—474 **20 Claims**

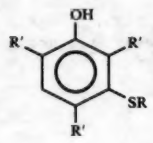
1. A process for producing dimethylamine comprising reacting methanol and/or dimethylether and ammonia in amounts sufficient to provide a carbon/nitrogen (C/N) ratio from about 0.2 to about 1.5, at a temperature from about 250° C. to about 450° C., in the presence of a catalytic amount of an acidic ZK-5 zeolite catalyst.

4,602,113
(HYDROCARBYLTHIO) PHENOLS AND THEIR PREPARATION

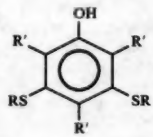
Bonnie G. McKinnie, Magnolia, Ak., and Paul F. Ranken, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 484,338, Apr. 12, 1983, Pat. No. 4,533,753. This application Nov. 14, 1983, Ser. No. 551,336
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] C07C *148/00, 149/36*
U.S. Cl. 568—54 **11 Claims**

1. A compound of the formula:

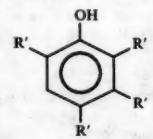


or a compound of the formula:



wherein the R′ groups are the same or different hydrocarbyl groups and R is a hydrocarbyl group having up to about 10 carbon atoms.

9. A process for making a compound of claim 6 said process comprising reacting a phenol having the formula:



wherein the R′ groups are the same or different hydrocarbyl groups with an excess of hydrocarbyl disulfide in the preence of an aluminum phenoxide catalyst at a temperature of 0°–300° C., the molar ratio of said catalyst to said disulfide being less than 1.

4,602,114

PREPARATION OF ε-CAPROLACTONE

Michael S. Matson, and Gerald R. Kahle, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 18, 1984, Ser. No. 621,986
Int. Cl.[4] C07D 313/04
U.S. Cl. 549—266 20 Claims

1. A process for the preparation of ε-caprolactone which comprises:

(a) reacting 4-penten-1-ol with CO in the presence of a ligand-stabilized Pd(II) catalyst complexed with a Group IVB metal halide and in the absence of acetonitrile to produce ε-caprolactone in the resulting product mixture; and

(b) recovering ε-caprolactone from the product mixture.

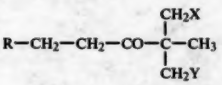
4,602,115

SUBSTITUTED 5-CYCLOALKYL-2,2-DI-METHYL-PENTAN-3-ONES

Heinz Ziemann, Leichlingen, and Karl-Heinrich Mohrmann, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 29, 1984, Ser. No. 676,136
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343532
Int. Cl.[4] C07C 49/163
U.S. Cl. 568—376 5 Claims

1. A substituted 5-cycloalkyl-2,2-dimethyl-pentan-3-one of the formula



in which

R is cycloalkyl with 5 to 7 carbon atoms or cycloalkyl with 5 to 7 carbon atoms which is mono-, di- or tri-substituted by identical or different alkyl radicals with 1 to 3 carbon atoms,

X is halogen and

Y is hydrogen or halogen.

4,602,116

PROCESS FOR THE SELECTIVE PRODUCTION OF KETONES

James L. Cooper, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 531,383, Sep. 12, 1983, abandoned. This application Apr. 9, 1985, Ser. No. 721,496
Int. Cl.[4] C07C 45/49
U.S. Cl. 568—387 6 Claims

1. A process for the production of ketones by the hydroformylation of at least one olefin in the presence of hydrogen, carbon monoxide, and a catalyst consisting essentially of triruthenium dodecacarbonyl wherein the molar ratio of olefin:ruthenium is about 200:1 to 3,000:1, the moler ratio of carbon monoxide:hydrogen:olefin is about 1:1.4:4 to 1:6:100, the total pressure is about 500 to 10,000 psig, the carbon monoxide partial pressure is about 50 to 500 psig, and the reaction temperature is about 60° to 250° C.

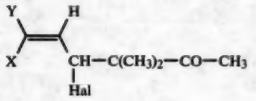
4,602,117

PROCESS FOR THE PREPARATION OF HALOGENATED 3,3-DIMETHYL-5-HEXEN-2-ONES

Reinhard Lantzsch, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,683
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441370
Int. Cl.[4] C07C 45/70
U.S. Cl. 568—393 8 Claims

1. Process for the preparation of a halogenated 3,3-dimethyl-5-hexen-2-ones of the formula (I)



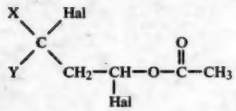
(I)

in which

X represents halogen,

Y represents halogen or trihalogenoalkyl and

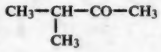
Hal represents chlorine or bromine, wherein an acetic acid ester of the formula (II)



(II)

in which

X, Y and Hal have the meanings indicated above is reacted with 2-methylbutan-3-one of the formula (III)



(III)

in the presence of an aqueous hydrogen halide acid and, if appropriate, in the presence of an additional inert diluent.

4,602,118

LIQUID PHASE OXIDATION OF ORGANIC COMPOUNDS TO THEIR HYDROPEROXIDES

Mau-Song Chou, Mountainside, and Keith W. Wohltman, Basking Ridge, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 9, 1984, Ser. No. 669,898
Int. Cl.[4] C07C *179/02*
U.S. Cl. 568—570 2 Claims

1. A process for the production of hydroperoxides comprising the steps of:

adding an oxygen-containing gas to a feed hydrocarbon selected from the group consisting of cumene, ethylbenzene, isobutane and cyclohexane in the presence of a promoter ketone selected from the group consisting of benzophenone, ortho-(NO_2) $(C_6H_4)_2C{=}O$, (meta-(NO_2) $(C_6H_4)_2C{=}O$, $(C_6F_5)_2C{=}O$ and $(C_6F_3)_2C{=}O$ which ketone results in a reaction rate to a corresponding hydroperoxide higher than the reaction rate occurring with acetophenone upon hydrocarbon at the same conditions, at a temperature between 100 and 200 C. to produce a corresponding hydroperoxide product, and

recovering the corresponding hydroperoxide product.

4,602,119

DEHYDRATION OF ALCOHOLS EMPLOYING A CARBOXYLIC ACID TREATED CATALYST

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 27, 1984, Ser. No. 604,712
Int. Cl.[4] C07C *1/24*
U.S. Cl. 585—640 10 Claims

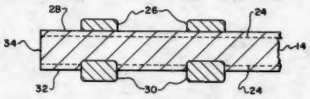
1. A process for dehydrating an alcohol to an olefin comprising contacting said alcohol, under dehydration reaction conditions of temperature and pressure with an alumina dehydration catalyst, where said catalyst has been subjected to a soaking treatment with an organic carboxylic acid for a time sufficient to provide a treated dehydration catalyst of improved selectivity and rate of conversion of alcohol as compared to untreated catalyst.

4,602,120

SOLAR CELL MANUFACTURE

G. Felix Wakefield, Woodland Hills, and Hyouk I. Yoo, Agoura, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 25, 1983, Ser. No. 555,253
Int. Cl.[4] H01L 31/06, 31/18
U.S. Cl. 136—256 8 Claims



2. A solar cell having an improved back face contact formed by the process of:

(a) introducing an active impurity of an opposite conductivity imparting type into the back face of a semiconductor wafer to establish a p-n junction therein;

(b) applying a metallization material in a gridded pattern covering no more than 50% of the back face, said material being chosen so that upon firing it penetrates said p-n junction; and

(c) firing said wafer with said material to cause said metallization to penetrate said p-n junction and form a low resistance ohmic contact to the bulk of said wafer,

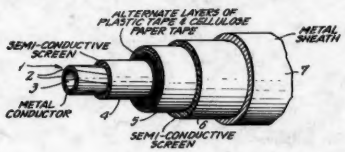
whereby at least 50% of said back face p-n junction remains in the finished device.

4,602,121

OIL-FILLED ELECTRIC CABLE WITH ALTERNATE LAYERS OF PLASTIC AND PAPER TAPE INSULATION

Paolo G. Priaroggia, Milan, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Jan. 11, 1985, Ser. No. 690,666
Claims priority, application Italy, Jan. 17, 1984, 19182 A/84
Int. Cl.[4] H01B 7/02, 9/06
U.S. Cl. 174—25 R 8 Claims



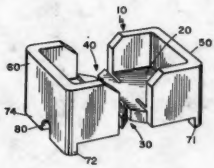
1. An oil-filled electric cable comprising at least a conductor, a semi-conductive screen around and in contact with said conductor, solid, stratified insulation around said screen, a metal sheath around said insulation and an insulating oil impregnating said insulation, wherein the improvement comprises a plurality of alternate, separate and different layers forming said insulation, at least one of said layers consisting essentially of a plurality of superimposed and contacting windings of plastic tape with smooth surfaces and the layers at opposite sides of and next adjacent to said one layer consisting essentially of a plurality of superimposed and contacting windings of cellulose paper tape with smooth surfaces.

4,602,122

AUTOMATICALLY-INSERTABLE CASE SUITABLE FOR WIRE-WOUND MAGNETIC CORES

James D. Lint, San Diego, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 18, 1984, Ser. No. 683,112
Int. Cl.[4] H01F 27/06
U.S. Cl. 174—52 R 1 Claim



1. A case suitable for holding a wire-wound core, which comprises:

a base on which to secure a coil wound on a toroidal core having an associated pair of leads, said base being shaped and dimensioned for compatibility with conventional automatic insertion equipment, said base including means for inhibiting contact with the coil wound on a toroidal core secured on said base, said means for inhibiting contact including upwardly extending side portions forming an integral part of said base, and

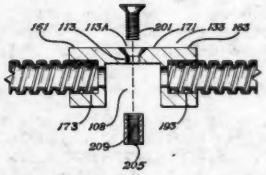
first and second pairs of finger formed as integral parts of said base, each said pair defining a slot slightly narrower than the diameter of corresponding one of the pair of leads of the coil wound on a toroidal core, said fingers being plastically deformable to enable the corresponding lead to be forced into said slot, each said slot having a notch at a predetermined position at which to grip a corresponding one of the pair of leads of the coil wound on a toroidal core, said first and second pairs of fingers extending outwardly in opposite directions.

4,602,123

ARMORED CABLES AND FITTINGS FOR TEST PROBES

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Filed Feb. 21, 1984, Ser. No. 581,608
Int. Cl.[4] H02G 15/00
U.S. Cl. 174—72 R 20 Claims



1. An armored cable and fitting for electrical leads, comprising:

a fitting member having first and second opposite ends,

a slot formed through said fitting member between said first and second opposite ends defining first and second spaced-apart structural portions extending from the same side of a base portion such that said fitting member is generally C-shaped as seen from two opposite sides thereof,

said first structural portion being between said slot and said first end and said second structural portion being between said slot and said second end,

an aperture extending through said first structural portion between said first end of said fitting member and said slot, said aperture having an enlarged portion next to said first end and a smaller portion next to said slot,

a flexible hollow cable located in said enlarged portion of said aperture and bonded to said first structural portion of said fitting member such that the interior of said cable is in communication with said slot by way of said aperture.

4,602,124

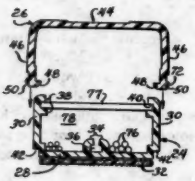
DUCTING SYSTEM FOR WIRING HAVING CHANNEL ALIGNMENT INTERFACE MEMBERS

Donald Santucci, 1780 Shire Ct., Wheaton, Ill. 60187

Filed Jun. 21, 1982, Ser. No. 390,757

Int. Cl.⁴ H02G *3/04, 3/06*

U.S. Cl. 174—101 **1 Claim**



1. A duct for wires, cables, conduits or like objects including: elongated U-shaped channel means and elongated U-shaped channel cover means; the channel means having a substantially flat bottom; adhesive means along the bottom permitting the channel means to be rapidly secured to a surface without resort to screws, nails or other similar anchors requiring defacing penetration of the surface; a pair of generally parallel channel sidewalls extending generally perpendicularly from the bottom defining a cable carrying region therebetween; each channel sidewall having a pair of spaced ridges disposed into the cable carrying region, the ridges defining respective channel sidewall cable retention clip slots; a pair of spaced ridges along the bottom disposed into the cable carrying region, the ridges along the bottom defining a bottom cable retention clip slot; indentations along the outward facing surfaces of each channel sidewall to receive and retain the channel cover means; the U-shaped elongated channel cover means having a top; a pair of generally parallel cover sidewalls extending generally perpendicularly from the top defining a channel receiving region therebetween, a ridge on each cover sidewall disposed into the channel receiving region adapted to engage the indentations on the channel sidewalls to secure and retain the cover means in covering engagement with the channel means; indentations along the outward facing surfaces of each cover sidewall adapted to receive and retain second cover means.

4,602,125

MOUNTING PAD WITH TUBULAR PROJECTIONS FOR SOLID-STATE DEVICES

Roger A. West, Woodbury; Dallas R Humphrey, Golden Valley; Carl R. Bergquist, Minnetonka, and David C. DeGree, Burnsville, all of Minn., assignors to The Bergquist Company, Minneapolis, Minn.

Filed May 10, 1985, Ser. No. 732,582

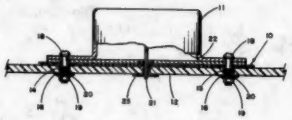
Int. Cl.⁴ H01B *17/56;* **H05K** *7/00;* **H01L** *23/14*

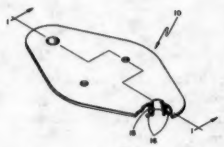
U.S. Cl. 174—138 G **2 Claims**

1. An electrically insulative member for use as a chassis mounting barrier in combination with a solid-state electronic device comprising:

(a) a thin base pad member having an upper surface to receive a solid-state electronic device thereon and a lower surface and being disposed along a certain plane;

(b) flexible tubular projections extending from the lower surface of said thin base pad member and defining bores extending from said base pad member to the ends of said tubular projections; and





(c) a plurality of radially extending flexible and deformable retention burrs of cylindrical configuration integral with the distal ends of said tubular projections, the axes of said retention burrs being generally normal to the bore axis of each of said tubular projections.

4,602,126

TWO-DIMENSIONAL COORDINATE DETECTING APPARATUS

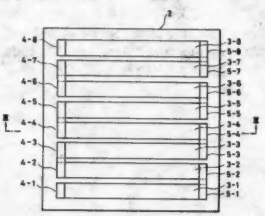
Masanori Hiraishi, Hyogo, Japan, assignor to Diacel Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 27, 1983, Ser. No. 507,644

Claims priority, application Japan, Jun. 25, 1982, 57-110357; Jul. 5, 1982, 57-117357; Aug. 6, 1982, 57-137758

Int. Cl.⁴ G08C *21/00*

U.S. Cl. 178—18 **4 Claims**



1. A two-dimensional coordinate detecting apparatus, comprising; a potential gradient layer and a detector layer which are normally separately disposed with a space therebetween and which are sufficiently flexible to enable local electrical contact with each other only when depressed, said potential gradient layer comprising a plurality of fragmentary conductive portions separated by insulator portions and each extending in the same direction, and said detector layer comprising a conductive layer, the fragmentary conductive portions of said potential gradient layer being successively supplied with a voltage so that the fragmentary conductive portion at a depressed position is detected from said detector layer, and, at the same time, the potential of the fragmentary conductive portion at the depressed position is detected from said detector layer.

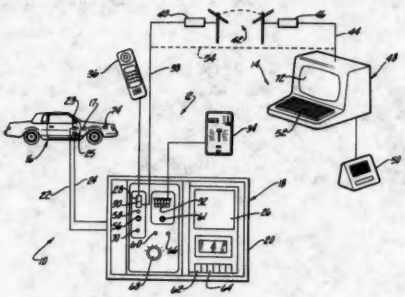
4,602,127

DIAGNOSTIC DATA RECORDER

James F. Neely, Washington, and James E. Krass, Jr., Grosse Pointe Woods, both of Mich., assignors to Micro Processor Systems, Inc., Sterling Heights, Mich.

Filed Mar. 9, 1984, Ser. No. 588,004
Int. Cl.[4] G06F *13/00*
U.S. Cl. 179—2 A 20 Claims

MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 103 Pages)



1. A portable communications controller for a vehicular diagnostic system comprising:

means for connecting said controller to a vehicle data terminal capable of supplying data representative of a plurality of parameters monitored by a vehicle computer;

means for connecting said controller to a source of electrical power in the vehicle;

microcomputer means for enabling the flow of said parameter data through said data terminal and for composing said parameter data into a predetermined data stream;

means for recording said data stream;

means for connecting said controller to a telephone line and for transmitting said data stream through said telephone line to a remote diagnostic data processor.

4,602,128

AUTOMATIC REDIALING ARRANGEMENT FOR MULTI-LINE TELEPHONE STATION SETS

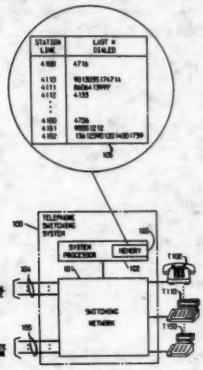
Glen G. Freundlich, Westminster, Colo., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Nov. 29, 1984, Ser. No. 676,257
Int. Cl.[4] H04M *1/274, 15/26*
U.S. Cl. 179—10 18 Claims

1. In a telephone switching system having a plurality of trunk and port circuits each of which are connected to an associated communication device via a communication line for interfacing said communication device to said telephone switching system, wherein said telephone switching system includes a switching network for interconnecting said trunk and port circuits, an automatic redialing apparatus comprising:

means responsive to the dialing of a number at any of one or more of said communication devices for storing said dialed number in a memory location associated with the communication line on which said number was dialed;

means responsive to said communication device next accessing said communication line and generating a last number dialed request signal for automatically establishing a call



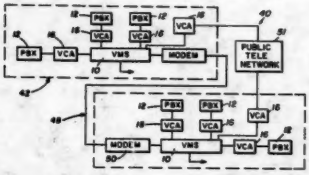
connection from said communication device to the destination identified by said dialed number.

4,602,129

ELECTRONIC AUDIO COMMUNICATIONS SYSTEM WITH VERSATILE MESSAGE DELIVERY

Matthews, Gordon H., Plano; Thomas B. Tansil, and Michael L. Fannin, both of Dallas, all of Tex., assignors to VMX, Inc., Richardson, Tex.

Continuation-in-part of Ser. No. 97,240, Nov. 26, 1979, Pat. No. 4,371,752. This application Sep. 29, 1982, Ser. No. 427,591
The portion of the term of this patent subsequent to Feb. 1, 2006, has been disclaimed.
Int. Cl.[4] H04M *3/50*
U.S. Cl. 179—18 B 12 Claims



12. A method for receiving, storing and forwarding audio messages from a user's telephone facility, comprising:

transmitting audio messages and associated route data from a user's telephone facility to a storage location;

storing digital representations of the audio messages and associated route data received from the user's telephone facility;

enabling access of the stored digital representations by a user;

accessing the stored digital representations of the audio messages;

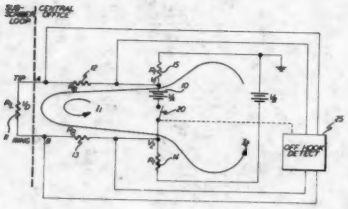
reproducing the audio messages in analog format from the stored digital representations; and

sequentially transmitting the reproduced audio message to the telephone facility of the user or a desired recipient, selectively restricting transmission of each reproduced audio message until a predetermined interval of time has elapsed.

4,602,130
DUAL VOLTAGE SOURCE FEED CIRCUIT CONFIGURATION FOR A TELEPHONE LINE CIRCUIT

Ramon C. W. Chea, Jr., Monroe, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Oct. 15, 1984, Ser. No. 660,585
Int. Cl.[4] H04M *19/00*
U.S. Cl. 179—18 FA 14 Claims



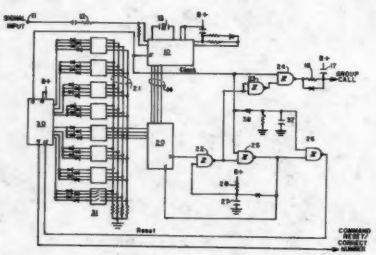
1. In a telephone subscriber line circuit of the type having a two-wire telephone subscriber line emanating from a central office to a subscriber location, said line being supplied with a current from a central office battery, said central office battery being coupled to said line via selected value feed resistors to supply a D.C. current to said line, the combination therewith of an auxiliary voltage source apparatus comprising:

a selectively operated voltage source coupled across said line and operative to supply an auxiliary operating current to said line, said auxiliary voltage source being coupled to said two-wire line via first and second auxiliary feed resistors of a magnitude substantially less than the magnitude of said selected value resistors.

4,602,131
TOUCH TONE DECODER

Charles Soulliard; Kevin Kelly, and Philip Lehman, all of Tucson, Ariz., assignors to Midian Electronics, Inc., Tucson, Ariz.

Filed Feb. 1, 1985, Ser. No. 697,464
Int. Cl.[4] G06F *15/31*
U.S. Cl. 179—84 VF 11 Claims



1. A control system responsive to a predetermined number sequence, comprising:

a data bus;

means for supplying said number sequence in the form of logic voltage levels to said data bus;

a reference code bus, including a plurality of individual conductors;

means for generating a plurality of mutually exclusive, sequentially stepped outputs;

a plurality of code setting means for establishing a reference code by each one of said code setting means selectively connecting a predetermined one of said plurality of mutually exclusive, sequentially stepped outputs to each of a plurality of individual conductors in said reference code bus;

means for comparing voltage levels on said data bus with voltage levels on said reference code bus and providing a coincidence signal in response to a positive comparison therebetween;

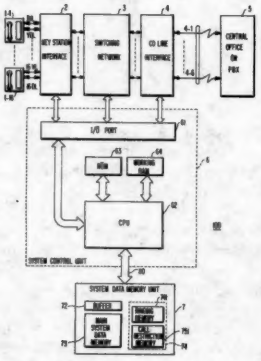
means for resetting said means for generating a plurality of mutually exclusive, sequentially stepped outputs when said coincidence signal is not generated; and

means for providing a correct number signal when said plurality of mutually exclusive, sequentially stepped outputs successfully sequence through said plurality of steps.

4,602,132
KEY TELEPHONE SYSTEM

Kazuyuki Nagatomi, and Rikio Sato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,207
Claims priority, application Japan, Sep. 20, 1983, 58-173493
Int. Cl.[4] H04M *5/00*
U.S. Cl. 179—99 R 1 Claim



1. In a key telephone system which includes a plurality of key telephone stations, a switching network for connecting the key telephone stations to CO lines or intercom lines, a system control unit, and a system data memory unit, said system control unit operating in response to stored data for controlling the operation of the key telephone stations and the switching control unit, at least one of the key telephone stations having CO buttons for specifying CO lines and DSS buttons for specifying the intercom designations for the key telephone stations, and being selectively operable as a control key telephone station, the improvement comprising:

memory means, comprised of a first system data memory and a second system data memory, for storing CO line related information for said plurality of key telephone stations, said memory means being a part of said system data memory unit which further includes a main system data memory; and

means, responsive to the operation of said DSS buttons and said CO buttons, for accessing said memory means at locations storing CO line related information for the intercom stations designated by the operated DSS buttons;

wherein said key telephone system operating as a control station further includes function buttons and means responsive to said function buttons for causing said control key telephone to switch between the usual operation mode and a system data set mode wherein first system data or second system data are set into said first system data memory and said second system data memory, respectively in response to the operation of said function buttons;

wherein said system control unit includes:

function data memory means storing the data set function designated by the operation of said function buttons;

station data memory means for storing a designation of a key telephone station specified by the operation of a DSS button;

CO button data separator means responsive to the operation of a CO button, for signaling CO designation of the operated CO button and for signaling other information relative to the operated CO button;

CO line data memory means, responsive to the output from said CO button data separator means, for storing a designation of a CO line specified by the operation of a CO button;

first memory selector means for selectively transferring the contents of said CO line data memory means to said first system data memory or said second system data memory;

second memory selector means for selectively transferring the contents of said station data memory means to first system data memory or second system data memory;

write data buffer means for storing said other information signaled by said CO button data separator; and

read data buffer means, for storing system data read from said first or second system data memory means; and

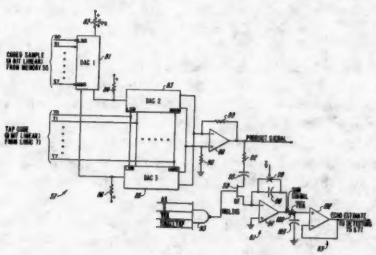
wherein each of said first and second system data memory means includes a memory array for storing system data relative to each CO line for each key telephone station, row address selector means responsive to the output of said second memory selector means for designating a row address corresponding to the key telephone station designatd by the operated DSS button, bit address selector means responsive to the output of said first memory selector means for designating bit addresses corresponding to the CO line designated by the operated CO button, and data read/write means for reading data from said memory array to said read data buffer means and for writing data in said write data buffer means into said memory array at memory locations addressed by said row and bit address selector means.

4,602,133

ADAPTIVE ECHO CANCELLING SYSTEM AND METHOD UTILIZING LINEAR CODE SPACING

John F. O'Neill, Boulder, Colo., assignor to GTE Lenkurt Incorporated, San Carlos, Calif.

Filed Jul. 23, 1982, Ser. No. 401,188
Int. Cl.⁴ H04B *3/20*
U.S. Cl. 179—170.2 **18 Claims**



15. In an echo cancelling system having linear code spacing, a multiplier unit comprising three digital-to-analog converters, one of said digital-to-analog converters being arranged to receive a first plurality of digital input signals indicative of a received signal, and the other of said digital-to-analog converters being arranged to receive a second plurality of digital input signals indicative of a termination network, said digital-to-analog converters being operative to pair-wise multiply the digital input signals to provide a product output signal.

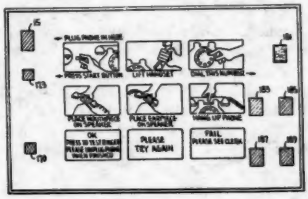
16. The multiplier unit of claim **15** wherein said analog-to-digital converters have current inducing resistors connected therewith.

4,602,134

TELEPHONE TESTER

Roger F. Atkinson; Steven C. Dennison; William D. Welch, Jr., and Ronald L. Jolly, all of Huntsville, Ala., assignors to Sace, Incorporated, San Angelo, Tex.

Filed Mar. 29, 1983, Ser. No. 479,874
Int. Cl.⁴ H04M *1/24*
U.S. Cl. 179—175.1 R **28 Claims**



28. In a telephone test apparatus for testing a telephone set, the combination comprising:

a panel having a plurality of individually illuminatable sections, each section representing a respective command to a user of the apparatus in operating the apparatus to test said telephone set;

means for automatically and sequentially illuminating said panel sections; and

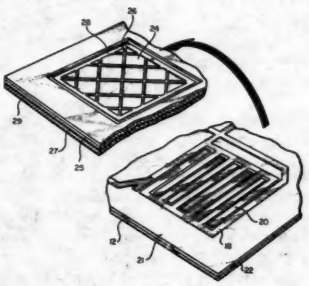
means for automatically initiating tests of different operating parameters of said telephone set after illumination of each panel section, respectively, in sequence.

4,602,135

MEMBRANE SWITCH

Robert F. Phalen, 1612 W. North Ave., Chicago, Ill. 60622

Filed May 30, 1985, Ser. No. 739,544
Int. Cl.⁴ H01H *13/70*
U.S. Cl. 200—5 A **11 Claims**



1. An improved membrane switch having a top sheet with a portion designated thereon for manual pushing to operate the switch, said switch comprising:

a pair of electronic switch circuit leads disposed in the same plane in noncontacting mutually relative close proximity, said pair of electronic switch circuit leads each comprising a plurality of intertwined but non-contacting elongated bars, said bars having a designated width;

supporting means for said electronic switch circuit leads;

a substantially planar circuit completing means of a size and shape to correspond with at least a portion of said pair of

switch circuit leads, formed from conductive material, and disposed in spaced array and substantially parallel to said switch circuit leads; and

a nonconductive spacer means comprising a grid, said grid comprising a plurality of substantially intersecting lines of a nonconductive material, said substantially intersecting lines of said grid having a width which is substantially narrow relative to the selected width of said elongated bars of said electronic switch circuit leads, said substantially intersecting lines of said grid disposed directly between said pair of electronic circuit leads and said circuit completing means, said spacer means grid having a plurality of apertures therein formed by said substantially intersecting lines of said grid and having a selected grid density sufficient to provide a selected touch pressure during pushing at least a portion of the said circuit completing means appearing through the apertures in said spacer grid into contact with at least a portion of the pair of electronic switch circuit leads to complete the circuit and to operate the switch.

4,602,136

MANUAL ACTUATING DEVICE FOR ENCLOSED ELECTRICAL SWITCHES

Albert Deneke, Kirke V rl se, and Kurt F. L. Pedersen, Hiller d, both of Denmark, assignors to Aktieselskabet Laur. Knudsen, Nordisk Elektricitets Selskab, Copenhagen, Denmark

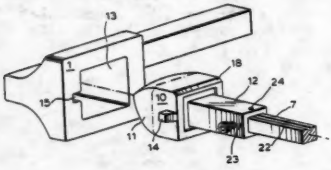
PCT No. PCT/DK84/00055, § 371 Date Feb. 15, 1985, § 102(e) Date Feb. 15, 1985, PCT Pub. No. WO85/00073, PCT Pub. Date Jan. 3, 1985

PCT Filed Jun. 18, 1984, Ser. No. 709,690

Claims priority, application Denmark, Jun. 17, 1983, 2797/83; Feb. 24, 1984, 1019/84

Int. Cl.[4] H01H *9/20*

U.S. Cl. 200—50 A **5 Claims**



1. A manual actuating device for an electric switch which is built into a cubicle and adapted to be activated by means of a handle mounted on an openable door via a rotatable switch shaft, said actuating device comprising: a first coupling member rotatably mounted in a door and fixedly connected to a handle and a second coupling member mounted on the switch shaft, said two coupling members being adapted to telescopingly engage with each other by closing the door and comprising mutually cooperating guiding surfaces which make the insertion of one of said coupling members into the other possible irrespective of misalignment therebetween by means of misalignment compensating means, and blocking means to secure against opening and closing of the door while the switch is connected, characterized in that said second coupling member comprises an engaging member cooperating with said first coupling member and a mounting member fixedly mounted on the switch shaft, said engaging member and said mounting member being mutually connected by means of said misalignment compensating means which is adapted to make possible the adjustment of said engaging member in any direction perpendicular to the axis of the switch shaft.

4,602,137

PULL-PUSH SWITCH

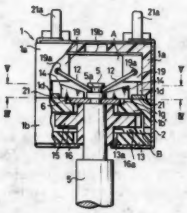
Kenzo Kawasaki, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed May 7, 1982, Ser. No. 376,1[illegible]

Claims priority, application Japan, May 7, 1981, 56-65165[U]

Int. Cl.[4] H01H *5/18*

U.S. Cl. 200—76 **1 Claim**



1. A pull-push switch comprising an insulating case having opposing side wall portions and a cross-wall portion extending therebetween, an operation shaft extending slidably through a central portion of said cross-wall portion and having a peripheral groove formed on a fore end portion thereof, movable contacts respectively held slidably in guide grooves formed in said side wall portions, said guide grooves extending parallel to the axis of said operation shaft to enable said movable contacts to move in directions parallel to the axis of said operation shaft, stationary contacts held in said case in a position along one end portion of the path of movement of said movable contacts, inverting springs held between said movable contacts and said peripheral groove of the fore end portion of said operation shaft, and means including tapered portions upstanding from said cross-wall portion and having the upper surface thereof decreasing gradually towards said operation shaft for guiding installation of said inverting springs about said peripheral groove of the fore end portion of said operating shaft.

4,602,138

KEYBOARD WITH REMOVABLE MODULAR KEYS

Eugenio Berutto, Ivrea; Giovanni Franchino, Tavagnasco, and Lino Sella, Banchette, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Continuation of Ser. No. 536,651, Sep. 28, 1983, abandoned. This application May 3, 1985, Ser. No. 729,906

Claims priority, application Italy, Sep. 28, 1982, 68141 A/82

Int. Cl.[4] H01H *9/08*

U.S. Cl. 200—340 **6 Claims**

1. A keyboard comprising a support plate having an external surface and an internal surface and provided with a plurality of through openings; a printed circuit board connected with said support plate; means for maintaining said printed circuit board parallel to and beneath said support plate at a determined small distance therefrom; an electrical circuit carried on a first surface of said printed circuit board facing the internal surface of said first support plate and having a plurality of pairs of fixed electric elements disposed in correspondence with said plurality of through openings; and a plurality of modular keys each removably mounted in said through openings for operating on a corresponding pair of said electric elements, wherein each one of said modular keys comprises:

an actuation member;

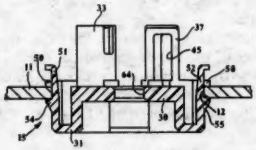
a central body having a central longitudinal axis, transverse shoulders, longitudinal guides projecting upwardly from said shoulders for guiding said actuation member, and a lower portion insertable into said through openings, wherein said lower portion defines a cavity and a central hole and comprises a plurality of pins projecting downwardly adjacent to said shoulders and a pair of longitudi-

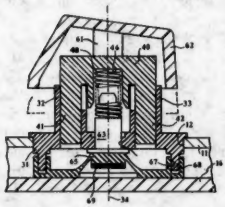
nal and resilient tongues projecting upwardly from a lowest edge of said lower portion;

an insulated dome spring having a dome portion carrying a movable contact and provided with a lowest edge and a holed portion adjacent to said dome portion and provided with a plurality of holed projections engageable by said plurality of pins to have said dome portion located in said cavity beneath said hole;

an intermediate striker member passing through said hole to operatively connect the dome portion of said dome spring with said actuation member to cause said movable contact to be moved towards and away from said corresponding pair of said electric elements;

and mounting means for removably mounting said central body in each one of said through openings of said first





support plate comprising tooth portions and removal portions of said pair of longitudinal tongues;

wherein said tooth portions are cooperable with the internal surface of said support plate, said transverse shoulders are cooperable with the external surface of said support plate, and the removal portions of said pair of longitudinal tongues are manually operable to bend said tongues inwardly with respect to said central body for removing each body and spring dome from the corresponding through opening of said first support plate; and

wherein said central body causes the lowest edge and the holed portion of said dome spring to bear against the firt surface of said printed circuit board upon the cooperation of said transverse shoulders with the external surface of said support plate.

4,602,139

INDUCTION BONDING METHOD AND APPARATUS

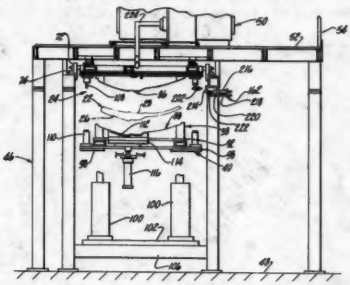
Roger L. Hutton, 3141 Pikewood Ct., Milford, Mich. 48042, and John P. Williams, Jr., 10475 Moon Lake Ct., Pinckney, Mich. 48169

Continuation-in-part of Ser. No. 655,684, Sep. 28, 1984, abandoned. This application Jun. 24, 1985, Ser. No. 748,391

Int. Cl.[4] H05B *6/40*

U.S. Cl. 219—10.43 **22 Claims**

1. A method of bonding together an assembly of at least two overlapped portions of sheet metal with a ribbon of plastic resin therebetween which can be cured by heating to an elevated temperature, which method comprises: disposing a pair of induction coils of an electrically conductive metal in spaced apart and generally opposed relation to each other and on generally opposite sides of the overlapped portions of sheet metal with the resin therebetween with each of said coils extending generally along and adjacent the ribbon of plastic resin, lying closely adjacent to at least one of the overlapped sheet metal portions and disengaged and spaced from all the sheet metal portions; applying to both of said coils an alternating current for a period of time of not more than fifteen seconds and at a high enough frequency to heat by induction to a temperature of at least 200° F. only the portions of the sheet metal immediately adjacent the ribbon of resin; and supporting the assembly with the overlapped portions of sheet metal and



the ribbon in such relationship to said coils without any substantial restraining of the overlapped sheet metal portions from flexing and moving due to being heated to an elevated temperature by the current applied to said coils and while subsequently cooling sufficiently for the resin to at least partially bond them together, whereby the temperature of the resin between the sheet metal portions is raised to a curing temperature and the resin is at least partially cured to bond the two pieces of overlapped sheet metal together without any significant distortion or warping of the assembly.

4,602,140

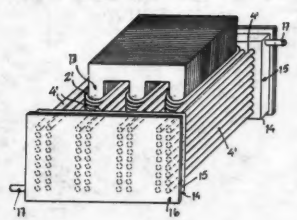
INDUCTION FLUID HEATER

Antoni Sobolewski, S.Bernardo do Campo, Brazil, assignor to Mangels Industrial S.A., Sao Paulo, Brazil

Filed Nov. 1, 1984, Ser. No. 667,463

Int. Cl.[4] H05B *6/10*

U.S. Cl. 219—10.51 **4 Claims**



1. An inductive electric heater for heating a fluid comprising a magnetic core, a primary winding wound on the core adapted to be connected to an alternating voltage source of any given frequency, a tubular secondary winding coupled magnetically to the primary winding by means of the magnetic core, the magnetic core having a plurality of legs on which the primary winding is wound, the secondary winding including a plurality of straight tubes extending between the legs and laterally of the legs outside the core, the tubes extending parallel to the primary winding, fluid reservoirs to which the ends of at least a portion of the tubes are connected, the reservoirs and tubes being non-magnetic and electrically conductive, and

means directing fluid into one reservoir and out the other reservoir through the tubes.

4,602,141

DEVICE FOR PREVENTING ELECTROMAGNETIC WAVE LEAKAGE FOR USE IN MICROWAVE HEATING APPARATUS

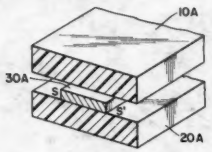
Yoshiyuki Naito, 9-29, Tsukimino/Yamato-shi, Kanagawa-Ken, Yamato-shi, and Michiharu Takahashi, 390-190, Takazu, Yachiyo-shi, both of Japan

Filed Aug. 9, 1985, Ser. No. 764,244

Claims priority, application Japan, Jun. 7, 1985, 60-123665

Int. Cl.[4] H05B *6/76*

U.S. Cl. 219—10.55 D **4 Claims**



1. A device for preventing electromagnetic wave leakage for use in a microwave heating apparatus comprising:

(a) a microwave heating apparatus body provided with a door, and

(b) an electromagnetic wave absorber disposed between said apparatus body and said door, said absorber consisting of a mixture obtained by mixing ferrite powder, carbon powder and a high polymer in the ratio of p:q:1 by weight where p is a value ranging from 2 to 4 and q is a value ranging from 0.5 to 2.

4,602,142

ELECTRIC DISCHARGE SYSTEM INCLUDING MEANS TO NORMALIZE THE INTERPOLE GAP TO MINIMIZE ABNORMAL DISCHARGE CONDITIONS

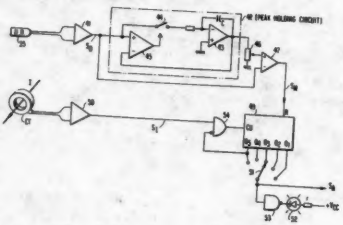
Tetsuroh Itoh, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,512

Claims priority, application Japan, Jun. 30, 1982, 57-113550; Jul. 28, 1982, 57-131629; Jul. 28, 1982, 57-131630; Aug. 2, 1982, 57-134921; Aug. 2, 1982, 57-134922; Aug. 2, 1982, 57-134923

Int. Cl.[4] B23H *1/02, 1/10*

U.S. Cl. 219—69 C **41 Claims**



6. An electric discharge machine comprising an electrode fixed to an electrode-supporting rod disposed across a workpiece through an insulating working liquid;

a working power supply connected across said workpiece end said electrode for intermittently supplying a working current to an interpole gap across said electrode and said workpiece;

an interpole voltage detector for detecting the interpole voltage across said electrode and said workpiece;

a reference voltage setting device for setting the voltage corresponding to the predetermined interpole gap;

a comparator amplifier for comparing the voltage detected by said interpole voltage detector and the reference voltage given by said reference voltage setting device and amplifying the difference between the signals;

an electrode driving device for driving said electrode-supporting rod to raise and lower said electrode according to the signal from said comparator amplifier, said electrode driving device including an oil hydraulic servomechanism;

a device for supplying the insulating working liquid to said interpole gap;

a detector for detecting the working current supplied to said interpole gap;

means including an ultrasonic sensor for detecting the impulse wave generated when discharge is caused in said interpole gap;

means for determining the conditions of said interpole gap from the size of the impulse wave detected by said means for detecting the impulse wave and the detected current signal provided by said detector for detecting the working current and outputting a signal based on the determination; and

means for restoring said interpole gap to the normal limits according to the signal given by said means for determining the conditions of said interpole gap;

wherein said means for determining the conditions of said interpole gap comprises a peak hold circuit for storing the highest value of the signal given by said ultrasonic sensor; a comparator for comparing the signal provided by said peak hold circuit with the signal provided by said ultrasonic sensor and outputting a signal of comparison; a counter for counting according to the detected current signal provided by said current detector, said counter being reset by the signal provided by said comparator; and a signal output device for applying a signal when the value counted by said counter has reached a predetermined value.

4,602,143

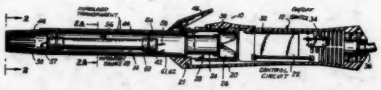
INFRARED HAIR STYLING DEVICE

William Mack, Commack, N.Y., and Daniel Santhouse, Stratford, Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Nov. 14, 1984, Ser. No. 671,344

Int. Cl.[4] H05B *1/02, 3/00*; A45D *1/04, 2/36*

U.S. Cl. 219—225 **3 Claims**



1. A hair styling device comprising:

a hollow hair winding portion for having hair wound thereupon and a hair clip means for retaining hair adjacent said hair winding portion, both said hair winding portion and said hair clip means being substantially transparent to electromagnetic radiation within a predetermined range of wavelengths;

an electromagnetic radiation source within said hair winding portion for emanating radiation within said predetermined range;

energizing means operatively connected to said source for activating same;

control means operatively connected to said energizing means for intermittently activating said source in a predetermined manner, said control means further comprising a temperature sensor operatively connected to sense the temperature of said hair winding portion and said control

means for maintaining the temperature of said hair winding portion within a predetermined range while said hair styling device is in use; and

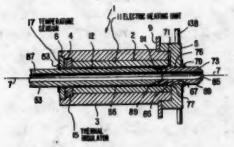
a handle means for supporting said hair winding portion, said hair clip means, said source, said energizing means and said control means, said handle substantially aligned with said hair winding portion.

4,602,144

TEMPERATURE CONTROLLED SOLDER EXTRACTOR ELECTRICALLY HEATED TIP ASSEMBLY

Alan D. Vogel, Columbia, Md., assignor to PACE Incorporated, Laurel, Md.

Filed Sep. 18, 1984, Ser. No. 651,769
Int. Cl.[4] B23K *3/04;* H05B *1/02*
U.S. Cl. 219—230 **16 Claims**



1. In a solder extractor comprising an elongated heat generating element having a longitudinal axis, a forward end, a rearward end and an axial passageway therethrough extending along said longitudinal axis and a hollow tubular dissoldering tip coaxially heat conductively received within said axial passageway and extending forwardly from said forward end, the improvement comprising

temperature sensing means, mounted in heat exchange relation with said tip, for detecting the temperature of said tip, said temperature sensing means located forwardly of and spaced apart from said heat generating element;

thermal insulation means, intermediate said temperature sensing means and said heat generating element, for inhibiting heat transfer from said heat generating element to said temperature sensing means.

6. In a solder extractor comprising an elongated heat generating assembly having a longitudinal axis, a forward end, a rearward end and an axial therethrough extending along said longitudinal axis and a hollow tubular desoldering tip coaxially received within said axial passageway and extending forwardly from said forward end, the improvement comprising

resilient retention means, disposed within said axial passageway intermediate said hollow tubular desoldering tip and said heat generating element, for heat conductively connecting said heat generating element and said tip and generating frictional force to inhibit relative movement between said heat generating element and said tip.

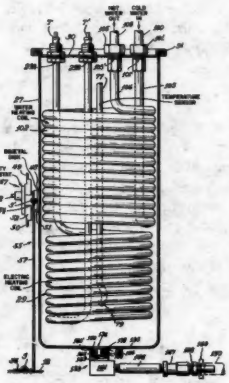
4,602,145

TAP-OFF HOT WATER SYSTEM FOR ELECTRIC BEVERAGE MAKING DEVICE

Melvin F. Roberts, Niles, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.

Filed Jul. 23, 1984, Ser. No. 633,417
Int. Cl.[4] H05B *1/02, 3/82;* F24H *1/2;* A47J *31/00*
U.S. Cl. 219—297 **7 Claims**

1. In a beverage-making device of the type having a hot water container for holding a volume of water and arranged with a removable cover means sealed thereover, the hot water container being in communication with timed inlet valve means for admitting a predetermined amount of cold water into the container, the inlet valve means fluidly associating with a source of cold water, thermostatically controlled electric heater means arranged within said container to be bathed by said volume of water and adapted for heating said volume of water to a predetermined constant temperature within the container, and outlet means communicating through said cover means interiorly of said hot water container for siphoning hot water from the container and conveying said heated water to be discharged therefrom remote from said hot water container, the improvement comprising a separate hot water system for heating and continuously discharging hot water independently of the outlet means at a temperature substantially the same as said volume of water in said container; said hot water system having separate means for receiving water from said source of cold water upstream of said inlet valve means, upwardly extending inlet pipe means fluidly communicating with said means for receiving water; a continous tubular water coil means immersed in said volume of water in said container, said water coil means having a top and bottom, said water coil means including a receiving tube extending upwardly from the



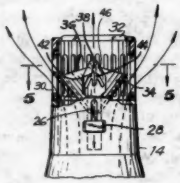
bottom of the water coil means and connected to said inlet pipe means at a fitting means associated with said cover means whereby to be in fluid communication with said inlet pipe means through said cover means, whereby a separate volume of water is capable of being heated within said water coil means by the surrounding volume of heated water in said container, said water coil means further including an outlet tube extending upwardly from the top of the water coil means for conveying hot water therefrom; discharge pipe means being connected to said outlet tube at a second fitting means associated with said cover means whereby the discharge pipe means is in fluid communication with said outlet tube, said discharge pipe means extending from said cover means and having a water faucet means arranged therealong remote from said hot water container; said water faucet means being operable to dispense hot water from said discharge pipe means, said water coil means providing a flow path sufficiently long that the water flowing therethrough from said receiving tube to said outlet tube is heated to substantially the same temperature as the heated water in the container for discharge through said faucet for an unlimited duration and independently of the water discharging from said outlet means.

4,602,146

HAND HELD HAIR DRYER

Ileana D. Barns, Weston; Raymond W. Kunz; James G. Montagnino, both of Monroe, and Herbert M. Morrison, Trumbull, all of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,963
Int. Cl.[4] F24H *3/04*; A45D *20/12*
U.S. Cl. 219—373 6 Claims



1. In a hair dryer having heating means disposed therein, air moving means for moving a stream of air over said heating means and axially out of air discharge means, the improvement which comprises:

air discharge means comprising a nozzle having a discharge end and a plurality of openings symmetrically located in the periphery of said nozzle;

a pair of diffuser vanes for directing air flowing through said air discharge means, said vanes pivotally mounted within said nozzle symmetrically to the axis thereof and adjacent to said openings, said diffuser vanes adapted to being placed in either a closed position for directing a portion of said stream of air through said discharge end and a portion thereof substantially axially through said openings, or an open position for directing substantially all of said stream of air through said discharge end by sealing said openings;

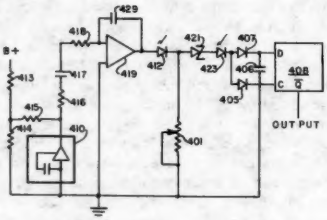
and means for changing the position of said diffuser vanes relative to said openings.

4,602,147

ROASTING TIMER

Harold A. Gell, 13720 Lockdale Rd., Silver Spring, Md. 20906

Continuation-in-part of Ser. No. 555,659, Nov. 28, 1983, Pat. No. 4,494,314. This application Dec. 31, 1984, Ser. No. 687,987
The portion of the term of this patent subsequent to Jan. 25, 2002, has been disclaimed.
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—509 6 Claims



1. A method for controlling the roasting duration of a food product, comprising the steps of:

turning on a heating source for said food product; sensing when the food product begins emitting sounds of a predetermined magnitude; and

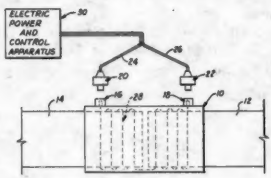
turning off said heating source when the level of said sound from said food product decreases below a predetermined magnitude.

4,602,148

THERMOPLASTIC FITTING ELECTRIC HEAT WELDING METHOD AND APPARATUS

Russel G. Ramsey, Holdenville, Okla., assignor to Central Plastics Company, Shawnee, Okla.

Filed May 16, 1985, Ser. No. 734,836
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—535 8 Claims



1. A method of electrically heat welding a thermoplastic fitting having an electric resistance heating element disposed therein whereby a predetermined regulated quantity of electric power is supplied to the heating element during the welding process and the making of a high quality weld is insured comprising the steps of:

(a) connecting said fitting to a controlled electric power source whereby said resistance heating element of said fitting is supplied with controlled electric power;

(b) sensing the initial temperature of said fitting;

(c) sensing the initial magnitude of the current flowing through said resistance heating element of said fitting and comparing such magnitude with predetermined current levels for various sizes of fittings at said initial temperature of said fitting to thereby determine the size of said fitting being welded and the total time the controlled electric power should be supplied to said resistance heating element of said fitting to insure the making of a high quality weld;

(d) continuing to sense the magnitude of the current flowing through said resistance heating element of said fitting over the time said controlled electric power is supplied thereto and comparing such magnitude at predetermined time intervals with predetermined current levels for the size of fitting determined in step (c) to thereby determine if the welding process is proceeding abnormally at such time intervals; and

(e) terminating the supply of electric power to said resistance heating element of said fitting when it is determined that said welding process is proceeding abnormally in step (d) or otherwise at the end of the total time required for the making of a high quality weld as determined in accordance with step (c).

4,602,149

TRANSACTION PROCESSOR

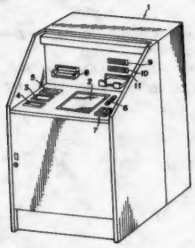
Kazuma Tateisi; Masanori Nagata, both of Kyoto, and Mamoru Hirayama, Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 26, 1983, Ser. No. 517,380
Claims priority, application Japan, Aug. 7, 1982, 57-137481
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 8 Claims

1. A transaction processor comprising:

a transaction mode setting means for selecting either a cash deposit mode in which cash is to be directly deposited into the processor or an envelope deposite mode in which cash placed into an envelope is to be deposited into the processor;

a judgement means for receiving, checking and accepting cash directly deposited by a depositor when said deposit mode is selected by said transaction mode setting means, said judgement means returning to said depositor cash which is judged to be unacceptable; and



a deposit mode processing means for executing a deposit processing procedure for cash which has been judged to be acceptable by said judgement means and for executing a cash return processing procedure for returning to a depositor cash which is judged to be unacceptable by said judgement means.

4,602,150

LOCKING AND UNLOCKING DEVICE

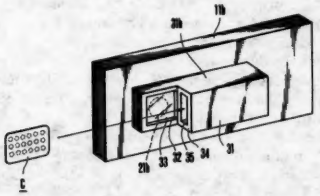
Makoto Nishikawa, and Minoru Tanaka, both of Hiroshima, Japan, assignors to Kumahira Safe Co. Inc, Hiroshima, Japan

Filed Feb. 15, 1984, Ser. No. 580,185

Claims priority, application Japan, Feb. 16, 1983, 58-24150; Apr. 1, 1983, 58-48425[U]; Dec. 14, 1983, 58-235858

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—382 **17 Claims**



1. A locking and unlocking device preferably employable for a double lock system comprising a bank lock and a client lock, characterized in that said locking and unlocking device comprises a casing with a window and a card insert hole formed thereon, a base plate fixedly secured to said casing, a plurality of permanent magnet pins slidably fitted through said base plate at a right angle relative to the latter, a sliding member adapted to slide in the casing in the longitudinal direction, said sliding member being formed with the same number of engagement holes as that of the permanent magnet pins which are normally projected through said engagement holes with the aid of resilient force of springs, and a magnetic card to be inserted through the card insert hole by a client, said magnetic card having a plurality of magnetized points of which position is determined so that they are located in alignment with the permanent magnet pins when the magnetic card is inserted and of which polarity is same to that of the corresponding permanent magnet pin, whereby by inserting the magnetic card into the casing the permanent magnet pins are caused to disengage from the engagement holes on the sliding member and the latter is ready to slide away from the window so that the client can insert his key through the window to open a client lock allocated to him.

4,602,151

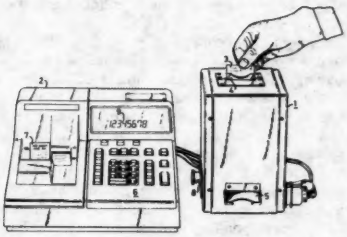
TAG READER

Bert V. Hellsberg, Hägersten, Sweden, assignor to Erling Persson, Sweden

Continuation of Ser. No. 359,392, Mar. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 222,216, Jan. 2, 1981, abandoned. This application Dec. 21, 1983, Ser. No. 563,551

Int. Cl.[4] G06K *15/00*

U.S. Cl. 235—383 **7 Claims**



1. A tag reader for registering on an electronic sales register the price of merchandise at point of sale comprising:

a tag reader for converting optically encoded pricing data to electronic data signals including:

a housing including a slot aperture for receiving said tag;

a tag presence detecting means for detecting the presence of said tag in said slot;

a tag feeding means connected to receive and advance said tag from said slot to a tag reading station;

bifurcation means connected to receive said tag from said reading station, said bifurcation means including first and second tag delivering paths, operable in response to the decoding of data on said tag;

tag reading means for reading optically coded information on said tag, said means including an error detector for checking of errors in read information, means for supplying said read optically coded information to electronic point of sales equipment for display; and

means for operating said bifurcation means to deliver said tag to a first of said delivery paths in the absence of an error detection, and to supply said tag to the second of said delivery paths when an error is detected.

4,602,152

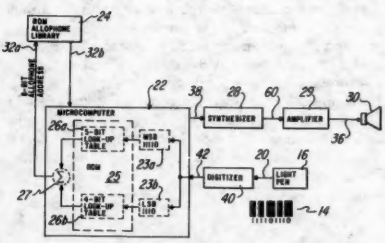
BAR CODE INFORMATION SOURCE AND METHOD FOR DECODING SAME

Ashok Dittakavi, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 24, 1983, Ser. No. 497,637

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—463 **8 Claims**



1. A bar code information source for providing coded data comprising:

a support material providing a surface on which coded data is to be disposed;

bar code means disposed on the surface of said support material and defining a plurality of data bar spaces adapted to provide bar code data to be retrieved, said plurality of data bar spaces differing in appearance as between dark and light regions and in width dependent upon the information content represented thereby;

said plurality of data bar spaces being arranged in a plurality of respective multibit binary words of bar code, each word having a predetermined number of bits of data;

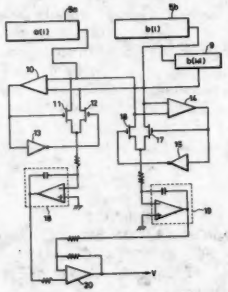
each respective multibit binary word as provided by said plurality of data bar spaces being defined by a plurality of multibit binary partial words including a first partial word having a first preselected number of the most significant bits of data and representative of a first numerical value and at least another partial word having a second preselected number of the least significant bits of data and representative of another numerical value; and

the numerical values represented by said plurality of partial words defining a respective multibit binary word upon being combined being representative of a decoded version of the corresponding multibit binary word having a plurality of bits reduced in number as compared to said predetermined number of bits of data constituting the respective word of bar code.

4,602,153
FOCUS DETECTION APPARATUS FOR A CAMERA

Kenji Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,539
Claims priority, application Japan, May 12, 1983, 58-81739
Int. Cl.⁴ G02B 7/11
U.S. Cl. 250—201 **2 Claims**



1. A focusing detection apparatus for detecting a focusing state of an object lens, comprising:

optical means for forming first and second images a relative positional relation of which changes in accordance with the focusing state of the object lens;

first and second sensing means for sensing the first and second images, respectively; and

discrimination means for discriminating the focusing state of the object lens in accordance with outputs of said first and second sensing means;

said discrimination means calculating a correlation V for discriminating the focusing state of the object lens in accordance with

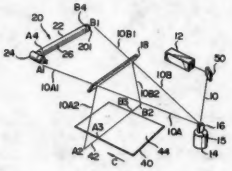
$$V = \sum_{i=1}^{N-1} \{a(i) \square b(i+1)\} - \sum_{i=1}^{N-1} \{a(i) \square b(i)\}$$

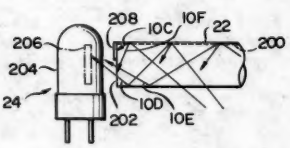
where N is the number of photo-electric conversion elements of said first or second sensing means, a(i) and b(i) are outputs of i-th photo-electric conversion elements of said first and second sensing means, respectively, and $\{x \square y\}$ is a constant operational relation for two real numbers x and y.

4,602,154
PHOTODETECTOR FOR GENERATING POSITION SIGNALS

Yutaka Taniguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 2, 1983, Ser. No. 548,256
Claims priority, application Japan, Nov. 2, 1982, 57-191902
Int. Cl.⁴ H04N 1/10
U.S. Cl. 250—227 **17 Claims**





1. A photodetector arrangement comprising:

an elongate, transparent light conducting member for causing light incident on a side periphery thereof to propagate axially therethrough toward an end thereof;

a photosensitive device located substantially at said end of the light conducting member to develop an electric signal in response to light streamed through the end of the light conducting member; and

light interceptor means for limiting a quantity of light which streams out of a portion of said end of said member which is remote from the side periphery of said member on which the light is incident.

4,602,155
ZERO REFERENCE GENERATING METHOD AND APPARATUS FOR OPTICAL ENCODERS

Dale LaPlante, Goleta, Calif., assignor to BEI Electronics, Inc., Santa Barbara, Calif.

Filed Jul. 25, 1983, Ser. No. 517,322
Int. Cl.⁴ G01D 5/34
U.S. Cl. 250—231 SE **16 Claims**

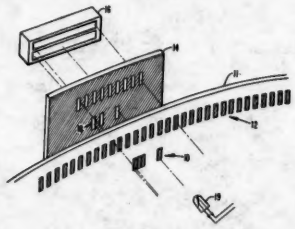
1. An improved optical encoder having a stationary member, a code disc supported for rotation with respect to the stationary member, indicia positioned on the code disc which define incrementally spaced angular positions of the code disc relative to the stationary member, and means positioned on the stationary member for sensing the indicia, the improvement comprising

a first set of zero reference indicia positioned on the code disc and arranged in a first sequence;

a second set of zero reference indicia positioned on the stationary member and arranged in a second sequence different from the first sequence; and

detection means positioned on the stationary member for determining the degree of registration between the first set of zero reference indicia and the second set of zero refer-

ence indicia corresponding to the incrementally spaced angular positions of the code disc relative to the stationary member, wherein the first set of zero reference indicia are ordered in relation to the second set of zero reference indicia so that the degree of registration therebetween corresponding to all incrementally spaced angular positions of the code disc relative to the stationary member is



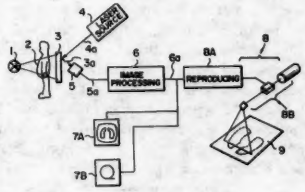
no greater than a predetermined background registration level, except for a selected zero reference position of the code disc, so that the degree of registration is maximized at the selected zero reference position, and so that the degree of registration corresponding to the angular positions of the code disc one angular position removed from the zero reference position is at the predetermined background registration level.

4,602,156

GRADATION CORRECTING METHOD FOR LIGHT-SENSITIVE MATERIAL

Eiichi Asai; Takao Komaki, and Yuma Adachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 1, 1983, Ser. No. 547,683
Claims priority, application Japan, Nov. 4, 1982, 57-193771
Int. Cl.⁴ G03C *5/16*
U.S. Cl. 250—327.2 **3 Claims**



1. A method of correcting the gradation of a radiation image reproduced in a light-sensitive material in a radiation image recording and reproducing system wherein a stimulable phosphor carrying the radiation image stored therein in a pattern of radiation energy is scanned by stimulating rays to emit light of the amount proportional to the level of the radiation energy stored, the emitted light is converted to an electric signal having a level corresponding to the emitted amount of light in a signal processing section, and a visible image corresponding to said radiation image is reproduced in a light-sensitive material by use of the electric signal in an image reproducing section,

the method of correcting the gradation of the radiation image reproduced in a light-sensitve material comprising the steps of:

(i) as the reference optical density values of the reproduced image, selecting an arbitrary value within the range of 0.2 to 0.5 and two arbitrary values at least 0.5 different from each other within the range of 0.4 to 2.6,

(ii) recording a latent image in the light-sensitive material for image reproduction by use of reference signals representing said reference optical density values as said electric signals,

(iii) developing said light-sensitive material to obtain a reproduced image,

(iv) measuring the optical densities at the portions of the reproduced image which correspond to said three reference optical density values, and

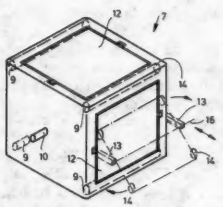
(v) on the basis of a comparison of the measured values with values on a reference gradation curve, said values corresponding to points on a line between said two arbitrary values on said reference gradation curve, adjusting at least one of said signal processing section and said image reproducing section so that the sensitivity is equal to the sensitivity on said reference gradation curve at the portion corresponding to said arbitrary value selected within the density value range of 0.2 to 0.5, and the gradient is equal to the gradient on said reference gradation curve at the portion corresponding to the density value range of 0.4 to 2.6.

4,602,157

X-RAY IMAGE RECORDING DEVICE

Harald Kayser, Wedel, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,493
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 3305912
Int. Cl.⁴ G01T *1/10*
U.S. Cl. 250—327.2 **5 Claims**



1. In an X-ray image recording device, comprising image storage means for storing X-ray shadow images, a read-out station for reading out the images stored in the image storage means, and an erasing station for erasing residual images present in the image storage means, the improvement, comprising:

a prismatic body having at least three sides surfaces, which carries the image storage means on said side surfaces and which can be rotated to present said side surfaces at at least three different positions about a first axis of rotation, said first axis being symmetrically situated with respect to said side surfaces;

at least three planar two-sided plates, the image storage means being disposed on both sides of each of said plates, each of the plates being impermeable to light and to X-rays, disposed on a corresponding side surface of the prismatic body, and rotatable through 180° about a second axis which is parallel to the plane of the plate so that in a first position of each plate a first side thereof is directed toward the interior of the body and in a second position thereof the second side is directed toward the interior of the body; wherein

the erasing station comprises illuminating means disposed within the body;

the sides of the body define apertures which expose the inwardly directed side of at least one plate to the illuminating means; and

the body, an image storage means, the read-out station, and the erasing station being arranged so that when the body is rotated to the various positions about the first axis,

image storage means cyclically and successively enter the storage means, the read-out station, and the erasing station.

4,602,158

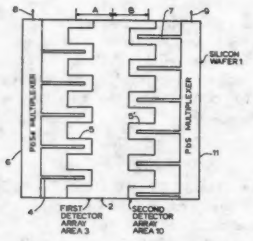
PbSe IR DETECTOR ARRAYS

John R. Barrett, Wayland, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 26, 1984, Ser. No. 665,271

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—338 **21 Claims**



1. A light detector array formed upon a substrate comprising:

a. a set of tooth-like electrodes positioned upon said substrate;

b. a set of elongated electrodes, positioned upon said substrate, each elongated electrode positioned between a pair of said tooth-like electrodes; and

c. a layer of photosensitive detector material positioned upon said substrate between said tooth-like electrodes and said elongated electrodes.

4,602,159

INFRARED DETECTOR

Yukio Kasahara, Tokyo, and Ritsuo Inaba, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

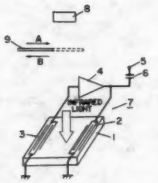
PCT No. PCT/JP83/00259, § 371 Date Apr. 9, 1984, § 102(e) Date Apr. 9, 1984, PCT Pub. No. WO84/00812, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 10, 1983, Ser. No. 606,775

Claims priority, application Japan, Aug. 10, 1982, 57-139419; Dec. 22, 1982, 57-223871

Int. Cl.[4] G01J *5/62*

U.S. Cl. 250—338 **3 Claims**



1. An infrared detector comprising an infrared detecting unit having a feedback type oscillator comprised of an elastic surface wave element and an amplifier, a shutter for intermittent irradiation of infrared light on said elastic surface wave element, and a counter for counting the number of output pulses occurring from said infrared detecting unit during an opening period within an interval between a time preceding a predetermined time with respect to an opening or closing time of said shutter and the opening time and counting the number of output pulses occurring from said infrared detecting unit during the closing period within an interval between said preceding time and said closing time, whereby a difference between the output pulse number during the opening period and the output pulse number during the closing period is counted by said counter to measure and detect the infrared light irradiated on said elastic surface wave element or temperature of an object emitting the infrared light.

4,602,160

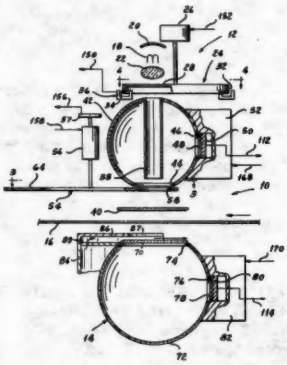
INFRARED CONSTITUENT ANALYZER AND CONTROL SYSTEM

John W. Mactaggart, Bolton, Canada, assignor to Sentrol Systems Ltd., Downsview, Canada

Filed Sep. 28, 1983, Ser. No. 536,677

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—341 **15 Claims**



1. Apparatus for measuring a constituent of a material including in combination means for directing infrared radiation upon a portion of said material, means for measuring infrared radiation reflected from said portion to produce a reflection signal, means for measuring infrared radiation transmitted through said portion to produce a transmission signal, said transmission signal having a dependence on elastic scattering of said radiation by said material, means responsive to said transmission signal for generating an indication of the content of said constituent, and means responsive to said reflection signal for correcting said content indication for the dependence of said transmission signal on elastic scattering.

4,602,161

NEGATIVE ION SOURCE WITH LOW TEMPERATURE TRANSVERSE DIVERGENCE OPTICAL SYSTEM

John H. Whealton, and William L. Stirling, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

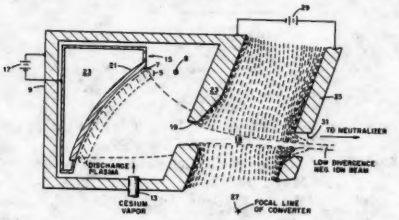
Filed Mar. 4, 1985, Ser. No. 707,939

Int. Cl.[4] H01J *27/02*

U.S. Cl. 250—423 R **3 Claims**

1. In an ion source for generating a beam of negative ions from a selected molecular species wherein said selected molecular species is introduced in a gaseous state into a chamber formed by an electrically conductive housing and including a converter plate having an ion converter surface disposed within said chamber, an ion extraction electrode forming a part of said housing disposed in front of said converter plate and having an exit slit therein through which said beam of negative ions produced in said chamber exit said chamber, an acceleration electrode disposed parallel to and spaced from said extrac-

tion electrode for accelerating said negative ions passing through said exit slit of said extraction electrode through a corresponding opening in said acceleration electrode, said converter plate being operated at a first potential relative to said housing so that positive ions of said species generated in a discharge plasma column extending over and spaced from said ion converter surface are accelerated onto said converter surface to convert said positive ions to negative ions of said species by means of surface ionization and subsequently ejected from said converter surface back through said plasma column toward said exit slit in said extraction electrode and wherein said ion source is immersed in a magnetic field extending parallel to said converter surface; the improvement wherein said converter plate is in the form of a cylindrical section the inside concave surface of which forms said con-



verter surface, said converter surface having a constant radius greater than the distance to said exit slit of said extraction electrode and wherein the focal line of said converter surface coincides with the geometric axis of said converter plate, said converter plate being disposed at an angle with respect to the direction of said beam of negative ions exiting said chamber so that said focal line is out of the path of said beam a sufficient distance to compensate for the magnetic field deflection of the negative ions ejected from said converter surface through said discharge plasma and focusing said negative ions into a beam which passes through said exit slit in said extraction electrode and wherein said acceleration electrode is positioned relative to said extraction electrode and operated at a second potential to provide said beam of negative ions in the form of a ribbon having a transverse divergence of less than 0.5 degrees.

4,602,162

MONITORING PORT FOR ULTRAVIOLET WATER PURIFICATION SYSTEMS

Elmer A. Sperry, III, Pompton Plains, and John M. Cluzel, Wyckoff, both of N.J., assignors to Beckman Industrial Corporation, Cedar Grove, N.J.

Continuation of Ser. No. 565,808, Dec. 27, 1983, abandoned. This application Dec. 26, 1985, Ser. No. 814,290

Int. Cl.[4] C02B *1/32*

U.S. Cl. 250—436 **21 Claims**

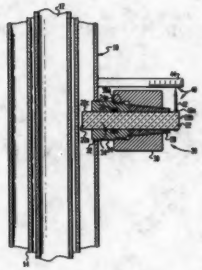
1. An apparatus for use in measuring the intensity of UV radiation at any selected one of a plurality of distances from an elongated UV lamp, which is mounted adjacent to an exterior fluid retaining wall of a UV liquid purification system, at least two of said distances being greater than zero, as measured from said lamp or any wall protecting said lamp from the liquid in the system, in order to determine UV radiation intensity in the system as a function of distance from said lamp, comprising:

(a) a UV transparent radiation transmitting member having a light receiving end,

(b) mounting means secured within a bore in said fluid retaining wall for slidably holding the transmitting member for movement in a direction generally transverse to said elongated UV lamp with said light receiving end facing said UV lamp,

(c) sealing means for maintaining a liquid-tight seal betwen the transmitting member and the mounting means, and

(d) locking means, separate from said sealing means, secured to said mounting means and contacting said transmitting member for locking the transmitting member with respect to said mounting means at a selected one of said distances from the UV lamp and for unlocking the transmitting



member with respect to said mounting means to permit sliding movement of said transmitting member with respect to said mounting means in said generally transverse direction to another selected one of said distances.

4,602,163

ELECTRO-OPTICAL SYSTEMS FOR CONTROL OF ROBOTS, MANIPULATOR ARMS AND CO-ORDINATE MEASURING MACHINES

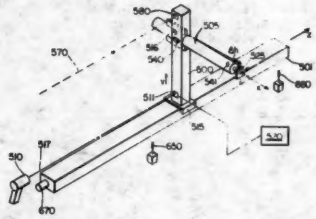
Timothy R. Pryor, 105 Centennial Dr., Tecumseh, Ont., Canada

Continuation of Ser. No. 262,492, May 11, 1981, Pat. No. 4,453,085. This application Mar. 22, 1984, Ser. No. 592,443

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

Int. Cl.[4] G01N *2/86*

U.S. Cl. 250—561 **6 Claims**



1. A method for correcting position data of a machine having a member movable on at least two co-ordinate axes, said machine comprising encoder means for providing rough position data to indicate the rough position of said member in each of said axes, said method comprising the steps of:

moving said moveable member to a position data correction location;

electro-optically determining the actual position of said member in at least two co-ordinate axes relative to a reference point external to said machine;

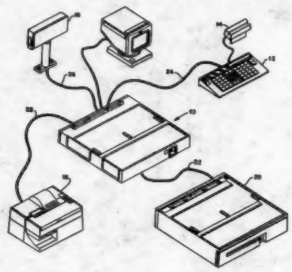
generating a signal representative of the electro-optically determining actual position of said member in said co-ordinate axes; and

utilizing said signal to correct the rough position data in said encoder means for said co-ordinate axes.

4,602,164
RADIATION SHIELD SYSTEM

Albert N. Gore, III, Raleigh; Robert C. Lynch, Cary; Ronald P. McAdams, and Gregory A. Shekita, both of Raleigh, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,834
Int. Cl.[4] H04B 3/28; H05K 9/00
U.S. Cl. 307—91 6 Claims

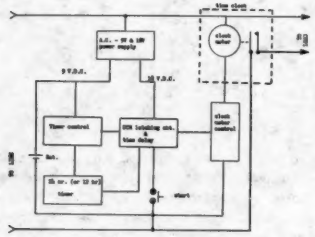


1. A system for providing EMI shielding enclosure and support for electrical devices comprising:
an electrical conductive housing:
an electrical conductive power supply connected to said housing;
a first means operable for supporting electrical devices;
second means operable for electrically coupling the first means to the power supply; and
third means coupled to the first means for providing an electrical interface between external units and the electrical devices and for completing the EMI shielding enclosure when the first means is being plugged into electrical communication with the power supply.

4,602,165
SWITCH ASSEMBLY FOR MAINTAINING AN ELECTRIC TIME SWITCH CLOCK SYNCHRONIZED WITH REAL TIME

Richard W. Rosenberg, Cinebar, Wash. 98533

Filed Feb. 25, 1985, Ser. No. 704,959
Int. Cl.[4] H01H 43/00
U.S. Cl. 307—141 1 Claim

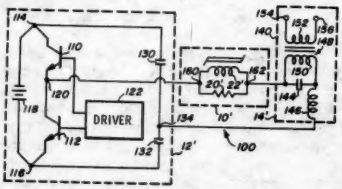


1. An automatic electric time delay switch assembly for maintaining a time switch clock synchronized with real time in the event of an electric power failure which comprises:
(a) an electric circuit including a power source,
(b) a time switch clock in the electric circuit,
(c) first electronic time delay means in the electric circuit operative to measure a first predetermined period of time after the occurrence of a power failure,
(d) electric relay means in the electric circuit operative in the open condition to disconnect the clock from the power source if the power failure remains at the conclusion of the said first predetermined time period, and
(e) second electronic time delay means in the electric circuit operative upon disconnection of the clock from the power source to maintain the relay means in its open condition for a second predetermined period of time which corresponds to a complete cycle of the clock,
(f) the second electronic time delay means being further operative to re-connect the clock to the power source in synchronization with real time at the conclusion of the second predetermined period of time, if during that period power has been restored to the circuit.

4,602,166
TRANSFORMER DRIVING NETWORK WITH PRIMARY CURRENT LIMITING MEANS

Steve Smith, 5100 Channel Ave., Richmond, Calif. 94804

Filed May 19, 1983, Ser. No. 495,971
Int. Cl.[4] H03K 3/45, 3/49, 3/01; H03B 1/04
U.S. Cl. 307—314 5 Claims

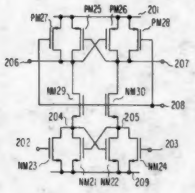


1. A power processor circuit for driving a transformer comprising:
voltage source means having first and second terminals for providing a voltage therebetween;
first switching means coupled between said first terminal of said voltage source means and a common node and having a control terminal;
second switching means coupled between said second terminal of said voltage source means and said common node and having a control terminal;
driver means coupled to the control terminals of said first and second switching means, said driver means driving said first and second switching means so as to alternately couple said common node to said first and second terminals of said voltage source means;
transformer means having a primary and secondary winding, said primary winding having a pair of terminals;
one terminal of said primary winding being coupled to said first voltage source terminal through a first voltage divider means and to said second voltage source terminal through a second voltage divider means;
network means coupled between the other terminal of said primary winding and said common node, said network means including a resistor for limiting to a predetermined level the current conducted through said primary winding during transitions of said first and second switching means and a saturable reactor connected in parallel with said resistor, said saturable reactor for forcing said winding current to flow through said resistor during each of said switching transitions and bypassing said resistor a predetermined period thereafter.

4,602,167
VOLTAGE COMPARATOR CIRCUIT

Akira Yukawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,730
Claims priority, application Japan, Nov. 26, 1982, 57-207004; Nov. 26, 1982, 57-207005
Int. Cl.⁴ H03K *5/24*
U.S. Cl. 307—355 **11 Claims**

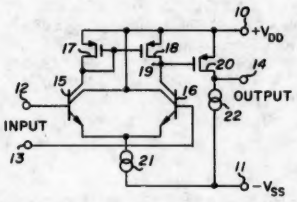


1. A voltage comparator circuit comprising a first flip-flop circuit having first and second data terminals and a first common terminal, means for connecting said first common terminal to a first voltage terminal, a second flip-flop circuit having third and fourth data terminals and a second common terminal, means for connecting said second common terminal to a second voltage terminal, charge means for operatively charging said third and fourth data terminals with a predetermined potential, first data means for determining a potential at said first data terminal in response to a first input voltage, second data means for determining a potential at said second data terminal in response to a second input voltage, first switch means for operatively connecting said first data terminal to said third data terminal, second switch means for operatively connecting said second data terminal to said fourth data terminal, first control means for enabling said charge means during a first period, and second control means for enabling said first and second switch means during a second period following said first poriod, and means for deriving an output signal from at least one of said third and fourth data terminals.

4,602,168
LOW OFFSET CMOS COMPARATOR CIRCUIT

Peter S. Single, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 28, 1984, Ser. No. 594,070
Int. Cl.⁴ H03K *5/24*
U.S. Cl. 307—355 **4 Claims**



1. A CMOS comparator circuit having a single ended output terminal and first and second differential input terminals, said circuit comprising:

an input stage comprising a pair of bipolar transistors, each one having an emitter, a base, a substrate dedicated collector, and a lateral collector adjacent to said emitter;

means for coupling said input stage transistor bases to said comparator input terminals;

means for coupling said pair of bipolar transistor emitters together and to a constant current sink to provide differential operation;

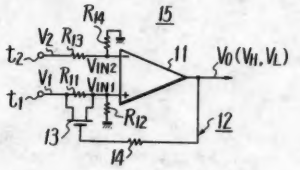
matched transistor load means coupled to said lateral collectors of said pair of bipolar transistors; and

amplifier means for coupling said matched transistor load means to said comparator output terminal.

4,602,169
SIGNAL COMPARING CIRCUIT

Yoshio Shimizu, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 28, 1983, Ser. No. 489,525
Claims priority, application Japan, Apr. 28, 1982, 57-70480; Jul. 30, 1982, 57-134125
Int. Cl.⁴ H03K *5/24*
U.S. Cl. 307—359 **10 Claims**



1. A signal comparing circuit comprising:

comparing means for providing an output signal at a level dependent on the relative levels of a plurality of circuit input signals, said comparing means including a differential amplifier for providing an output signal at one of two levels depending on which of two amplifier input signals has a higher level;

said amplifier input signals are derived from said respective circuit input signals;

a hysteresis circuit for providing a hysteresis width defining a range of relative levels of the compared signals within which range the level of the output signal remains unchanged, said hysteresis circuit including a variable gain attenuator circuit for adjusting said hysteresis width in response to at least one of said circuit input signal levels, the gain of said attenuator circuit being changeable between two levels in response to changes in said output signal level to provide at least one of said amplifier input signals at first and second input levels having a difference dependent on the level of said respective circuit input signal; and

a sensitivity matching circuit for changing the level of said other amplifier input signal thereby to change said hysteresis width.

4,602,170
RESISTIVE GATE FIELD EFFECT TRANSISTOR LOGIC FAMILY

Claude L. Bertin, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1983, Ser. No. 530,450
Int. Cl.⁴ H03K *19/094, 19/20, 29/76, 29/50*
U.S. Cl. 307—450 **7 Claims**

1. A field effect transistor logic circuit comprising:

a resistive gate field effect transistor device having a gate electrode composed of a resistive material and at least two input electrodes attached to different portions of the resistive gate, each input electrode being responsive to an

independent logic level input signal to independently control the conductivity of different portions of the field

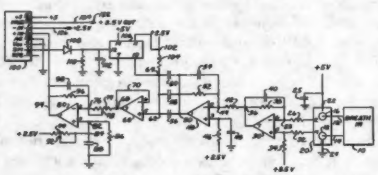
effect transistor device channel region as a function of the logic states of the logic level input signals.

4,602,171

INHALATION TRANSDUCER CIRCUIT WITH DC DRIFT COMPENSATION

Alfred G. Brisson, Schaumburg, and Christopher Nowacki, Arlington Heights, both of Ill., assignors to Trutek Research, Inc., Arlington Hts., Ill.

Filed Sep. 7, 1982, Ser. No. 415,735
Int. Cl.[4] G06G *7/10*; H03B *1/00*
U.S. Cl. 307—491 **9 Claims**



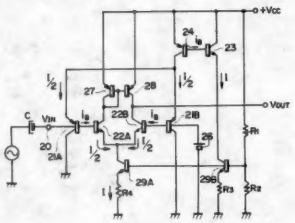
1. An inhalation transducer circuit comprising an air pressure-to-electric potential transducer for producing an electric potential proportional to a person's air inhalation capacity, said electric potential so produced being of a low magnitude, first electronic amplification means for receiving and amplifying said potential, second electronic amplification means for further amplifying said potential, a.c. coupling means between said first and said second amplification means, output means connected to said second amplification means and providing an output signal which is a greatly amplified function of said electric potential, said output means having an output potential only when said transducer has a potential, means providing a predetermined reference potential, restoring means connected to said a.c. coupling means and to said reference potential providing means and selectively conductive for periodically restoring said a.c. coupling means to said predetermined reference potential to avoid drift originating in said transducer or in said first amplification means, and said output means being connected to said restoring means and operating said restoring means only in the absence of said output potential.

4,602,172

HIGH INPUT IMPEDANCE CIRCUIT

Masafumi Kikuchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 10, 1983, Ser. No. 493,152
Claims priority, application Japan, May 18, 1982, 57-82385
Int. Cl.[4] H03K *5/22*; H03L *5/00*; H03G *3/18*
U.S. Cl. 307—494 **5 Claims**



1. A high input impedance circuit comprising:

a first differential circuit having a pair of NPN transistors and first and second input terminals;

a second differential circuit having a pair of PNP transistors and first and second input terminals,

said first input terminals of said first and second differential circuits being directly connected to each other and said second input terminals said first and second differential circuits being directly connected to each other;

a first current source circuit connected to said first differential circuit for driving said first differential circuit;

a second current source circuit connected to said second differential circuit for driving said second differential circuit;

a signal input terminal connected directly to said first input terminals of said first and second differential circuits for supplying an input signal having no DC component to said first and second differential circuits; and

nonresistive DC biasing means connected directly to said second input terminals of said first and second differential circuits for biasing said first and second differential circuits, whereby said nonresistive biasing means effects said high input impedance.

4,602,173

MAGNETIC PROPULSION DEVICE

Reginald Briscoe, and George Spector, both 233 Broadway Rm 3615, both of New York, N.Y. 10007

Filed Oct. 3, 1984, Ser. No. 657,353
Int. Cl.[4] H02K *7/00*; G09B *23/18*
U.S. Cl. 310—1 **3 Claims**

1. A generator utilizing the magnetic flux lines of the earth, comprising:

(a) a base;

(b) a frame attached to said base;

(c) a first shaft having a free end and being rotatably mounted in said frame;

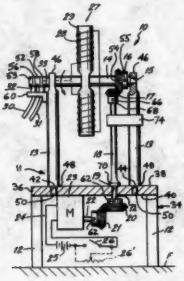
(d) means for rotating said first shaft;

(e) a plurality of brushes mounted on said frame;

(f) at least one ring affixed to said free end of said first shaft and being in rotatable contact with said plurality of brushes; and

(g) an armature oriented rotably to cut the earth flux lines, formed by coils of wire wound around a rod mounted on said first shaft, said coils of wire having free ends connected to at least one ring so that when said armature rotates, said coils of wire cut the magnetic flux lines of the earth and

cause an electric current to be generated at said plurality of brushes, wherein said rod is mounted perpendicular to said



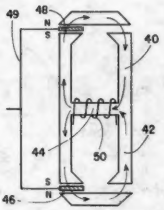
first shaft, wherein said means for rotating said first shaft includes a power source disposed in said base.

4,602,174

ELECTROMECHANICAL TRANSDUCER PARTICULARLY SUITABLE FOR A LINEAR ALTERNATOR DRIVEN BY A FREE-PISTON STIRLING ENGINE

Robert W. Redlich, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Continuation of Ser. No. 556,791, Dec. 1, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 720,004
Int. Cl.[4] H02K *33/00*
U.S. Cl. 310—15 **9 Claims**



1. An electromechanical transducer comprising:

(a) a plurality of flux loop members formed of a relatively high permeability material, each said flux loop member being stationary relative to the below said magnetic flux source and extending generally radially outwardly from a central axis to define a closed flux loop, each flux loop member having a pair of spaced gaps formed transversely through said loop member to provide two gaps in each magnetic flux loop member, said gaps being aligned along a reciprocation path parallel to said central axis;

(b) a central armature coil wound to encircle the central portions of all of said loop members; and

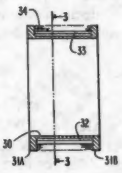
(c) a magnetic flux source mechanically mounted for reciprocation along said reciprocation path to alternate positions within said gaps each alternate position providing a reversal of flux direction, said source having a generally radial magnetization vector transverse to said reciprocation path and across said gap in the same radial direction at every gap and drivingly linked to a mechanical energy input or output.

4,602,175

DAMPED COIL CONSTRUCTION FOR VCM

Joseph T. Castagna, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,655
Int. Cl.[4] H02K *41/02*
U.S. Cl. 310—13 **4 Claims**



1. In a voice coil actuator for positioning magnetic heads in a disk file, an improved coil comprising:

(a) a cylindrical bobbin including a pair of end rings disposed on opposite ends of said bobbin, the bobbin and end rings thereby defining a cylindrically shaped channel;

(b) a cylindrical layer of viscoelastic material disposed in said channel with one self-adhesive surface in bonded contact with the surface of said bobbin corresponding to the bottom of said channel;

(c) a cylindrical layer of aluminum foil surrounding said layer of viscoelastic material for constraining said material in said channel; and

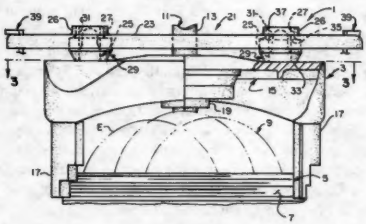
(d) a coil winding surrounding said layer of aluminum foil.

4,602,176

MEANS FOR AND METHOD OF REDUCING VIBRATION OF NOISE BETWEEN A DYNAMOELECTRIC MACHINE AND ITS APPLICATION

Gerald N. Baker, S. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 30, 1984, Ser. No. 645,994
Int. Cl.[4] H02K *5/24*
U.S. Cl. 310—51 **6 Claims**



1. In a dynamoelectric machine having a stator, said stator being secured to an application, said application having at least one aperture therein, said stator including an endshield, wherein the improvement comprises: said endshield having a stud extending threfrom, said application aperture being substantially coaxial with respect to said stud, an elastomeric grommet having a bore therethrough receiving at least a portion of said stud, said grommet bearing on said endshield and on said application, means for securing said application to said dynamoelectric machine and for at least partially compressing said grommet between said application and said endshield into an operating position, a first portion of said stud protruding beyond said endshield and having a cross section substantially equal to the cross section of a portion of said grommet bore,

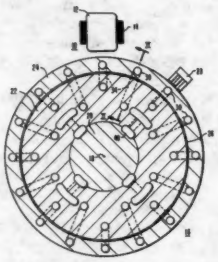
said grommet having a portion thereof between the outer end of said first portion of said stud and said application such that with said grommet being in its compressed, operating position, said grommet portion being clear of said stud in the region of this last-mentioned portion of said grommet so that this last-mentioned grommet portion is substantially unrestricted by said stud thereby to permit lateral .earing of said grommet portion substantially without impediment by said stud thereby to facilitate damping of mechanical vibration and/or acoustical noise between said application and said dynamoelectric machine.

4,602,177

HOMOPOLAR GENERATORS WITH THERMOSYPHONS FOR IMPROVED COOLING

Phillip W. Eckels, Penn Hills Township, Allegheny County, and Joachim V. R. Heberlein, Forest Hills Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 20, 1984, Ser. No. 684,437
Int. Cl.[4] H02K *9/08*
U.S. Cl. 310—57 **13 Claims**



1. A dynamoelectric machine comprising:
a stator;
a rotor having a substantially cylindrical mass arranged for rotation about an axis in relation to said stator;
means for distributing heat produced in said rotor mass during operation of the machine comprising at least one passageway within said mass having at least three interconnected legs including a first leg oriented substantially parallel to said axis, a second leg oriented substantially perpendicular to sai.l axis, and a third leg oriented substantially parallel to said axis radially inward from said first leg, said passageway having a flow divider extending proximate the center thereof and dividing substantially the entirety of said passageway into two substantially parallel open portions that are interconnected at ends of said passageway remote from each other to permit circulation of a fluid coolant in a loop including each of said two parallel portions in each of said legs.

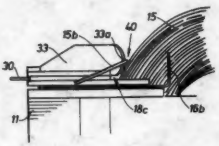
4,602,178

ELECTRIC ROTATING DEVICE

Nils F. Larsson, Spanga, Sweden, assignor to AB Electrolux, Stockholm, Sweden

Continuation of Ser. No. 490,296, May 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 240,932, Mar. 5, 1981. This application Mar. 18, 1985, Ser. No. 713,104
Int. Cl.[4] H02K *11/00*
U.S. Cl. 310—71 **17 Claims**

1. In an electric rotating device having a stator core provided with windings and supporting a terminal block of insulating material on one end thereof, the terminal block having at least one terminal pin, the improvement wherein said terminal block comprises a resilient tongue resiliently biased toward one of said windings to form together with said one of said windings a V-shaped opening, said terminal block further comprising a groove through which a wire end of said winding extends from said opening to said terminal pin.

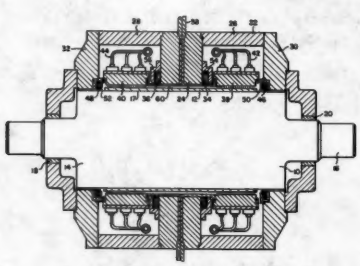


4,602,179

HOMOPOLAR DYNAMOELECTRIC MACHINE WITH AN AUXILIARY FIELD COIL

Stephen B. Kuznetsov, Washington, D.C., and Lee A. Kilgore, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 3, 1984, Ser. No. 677,769
Int. Cl.[4] H02K *31/00*
U.S. Cl. 310—178 **11 Claims**

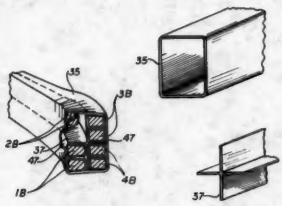


1. A homopolar dynamoelectric machine comprising:
a rotor;
an annular main field coil encircling a first portion of said rotor;
a stator structure supporting said main field coil and having a main pole piece for directing magnetic flux, produced by current flowing in said coil, radially into a section of said rotor;
a current transfer means making electrical contact with a current collecting zone on the surface of said rotor;
an annular auxiliary field coil encircling a second portion of said rotor wherein said first and second portions of said rotor are axially positioned on opposite sides of said current collecting zone such that current flowing in said auxiliary field coil reduces leakage flux, caused by current flowing in said main field coil, in the vicinity of said current collecting zone of the rotor; and
an auxiliary field coil flux shield positioned adjacent to said auxiliary field coil, wherein said auxiliary field coil has a generally rectangular cross section with one side of said auxiliary field coil lying adjacent to said rotor and said auxiliary field coil flux shield being shaped to conform to the other three sides of said auxiliary field coil.

4,602,180
INSULATED ARMATURE COIL FOR DYNAMOELECTRIC MACHINE

Hjalmar A. Olson, North East, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jan. 7, 1985, Ser. No. 689,217
Int. Cl.[4] H02K *3/30*
U.S. Cl. 310—215 **18 Claims**



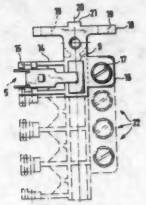
1. For insulating an armature coil in a dynamoelectric machine having a rotor which comprises a commutator formed by a cylindrical array of discrete electroconductive segments at one end of the rotor, an armature head at the other end of the rotor, a cylindrical core of magnetizable material disposed between said commutator and armature head, said core including a plurality of axially extending slots in its periphery, a plurality of multiple turn armature coils physically disposed in the slots of said core and electrically connected to selected commutator segments, each armature coil comprising a bundle of parallel, separately insulated conductors the distal ends of which are adapted to be connected to a predetermined set of said commutator segments, each of said conductors having a generally rectangular cross section and said bundle being bent to form a generally rectilinear winding having first and second relatively long and straight slot sections that are adapted to be inserted in two separate slots of said rotor core, said first and second slot sections being respectively Joined at their armature head ends to first and second shorter sections which form obtuse angles therewith and which in turn extend convergently to the outboard end of the armature head where they join one another via an acutely bent loop, an improved insulating system comprising a first pre-formed tube of substantially non-compressible, non-thermoplastic dielectric material surrounding the exterior surface of essentially the whole of said first slot section and the exterior surface of at least part of said first shorter section of said coil, and a second pre-formed tube of the same material surrounding the exterior surface of essentially the whole of said second slot section and the exterior surface of at least part of said second shorter section of said coil, each of said tubes fitting snuggly but slidably over the exterior surface of the surrounded sections to provide electrical insulation between said bundle of conductors and the slot walls of said core, the wall of each tube having a unitary, seamless construction, being thin and flexible enough to bend in any plane without appreciable loss of either its physical or its dielectric integrity, and having a smooth enough interior surface to permit longitudinal expansion and contraction of said insulated conductors inside the tube.

4,602,181
BRUSH HOLDER ASSEMBLY FOR USE IN ELECTRIC MACHINES

Wolfgang Dietrich, Fernsichtstrasse 19, CH-8200 Schaffhausen, and Michael Dietrich, Undere Schluchten, CH-8197 Rafz, both of Switzerland

Filed Nov. 5, 1984, Ser. No. 668,238
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—241 **11 Claims**

1. A brush holder assembly for use in electric machines, comprising a ring-shaped insulating holder having at least one end face; at least one brush carrier; and means for radially and axially adjustably affixing said carrier to said holder, said affixing means including an extension which is provided on said carrier and comprises an elongated flange, and said flange

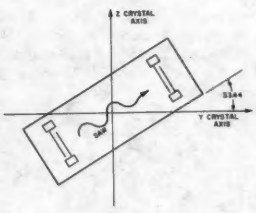


having an elongated surface facing said one end face, said affixing means further including first and second fastener means spaced longitudinally of said flange and arranged to secure the latter to said holder.

4,602,182
X33 CUT QUARTZ FOR TEMPERATURE COMPENSATED SAW DEVICES

Richard T. Webster, Bedford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 25, 1984, Ser. No. 614,190
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 A **2 Claims**



1. A surface acoustic wave (SAW) device substrate member of single crystal quartz having an acoustic surface wave propagation surface defined by a plane that substantially coincides with the Euler angles lambda=90°, mu=90°, and theta=33.44°.

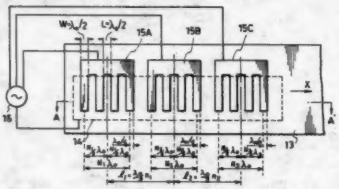
4,602,183
SURFACE ACOUSTIC WAVE DEVICE WITH A 3-PHASE UNIDIRECTIONAL TRANSDUCER

Takeshi Okamoto; Shoichi Minagawa, and Teruo Niitsuma, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,755
Claims priority, application Japan, Jul. 6, 1982, 57-118060
Int. Cl.[4] H03H *9/42*
U.S. Cl. 310—313 B **12 Claims**

4. In a surface acoustic wave device which includes: an elastic substrate; a lower electrode provided on a surface of said elastic substrate; a piezoelectric film covering said lower electrode; and a plurality of upper electrodes provided on a surface of said piezoelectric film opposite said lower electrode, the improvement comprising wherein said upper electrodes, in response to application of an electrical signal thereto, produce a surface acoustic wave in said piezoelectric film which propagates therethrough in a direction of propagation parallel to said surface on said elastic substrate, wherein said upper electrodes are each a comb-shaped electrode having a plurality of spaced

electrode fingers which extend transversely to and are spaced in a direction parallel to said direction of propagation of the surface acoustic wave, wherein said upper electrodes each have a center which is intermediate the outermost electrode fingers thereof in a direction parallel to said direction of propagation, said upper electrodes being spaced from each other in said direction of propagation of the surface acoustic wave so



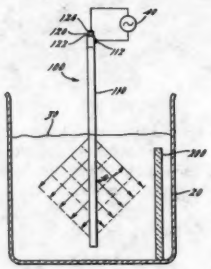
that the centers of adjacent upper electrodes are spaced in said direction of propagation by a distance which is an integer multiple of one-third of the wavelength of a center frequency of the surface acoustic wave; and wherein each said comb-shaped upper electrode is designed so that the width of each said electrode finger thereof and the distance between adjacent said electrode fingers thereof is one-half of the wavelength of said center frequency.

4,602,184

APPARATUS FOR APPLYING HIGH FREQUENCY ULTRASONIC ENERGY TO CLEANING AND ETCHING SOLUTIONS

Allen H. Meitzler, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 29, 1984, Ser. No. 666,017
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—322 **6 Claims**



1. An apparatus for applying high frequency energy to a liquid medium comprising:

transducer means formed by an elongated piezoelectric material responsive to a high frequency electrical signal for generating a high frequency vibration and located external of said liquid medium;

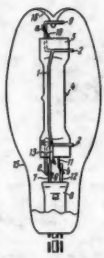
means formed by a mechanically elastic material having opposing planar surfaces and an upper edge, with said transducer means bonded to its upper edge and being partially immersed in said liquid medium for transmitting said high frequency vibrations from said transducer means to said liquid medium, wherein said transmitting means is a glass plate selected to have a predetermined value of velocity for conducting mechanical shear waves (V_s) and to have a plate thickness (T_p) according to the relationshp $F_wT_p=(0.707)V_s$ where F_w corresponds to the high frequency vibration being transmitted.

4,602,185

ARC TUBE SUPPORT OF GASEOUS-DISCHARGE LAMP

Lev M. Roiz; Mikhail M. Petukhov, and Arkady I. Kagansky, all of Poltava, U.S.S.R., assignors to Poltavsky Zavod Gazorazryadnykh Lamp Imeni Komsomola Ukrainy, Moscow, U.S.S.R.

PCT No. PCT/SU83/00006, § 371 Date Oct. 31, 1984, § 102(e) Date Oct. 31, 1984, PCT Pub. No. WO84/03797, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 24, 1984, Ser. No. 672,245
Int. Cl.[4] H01J *1/52, 19/40*
U.S. Cl. 313—25 **4 Claims**



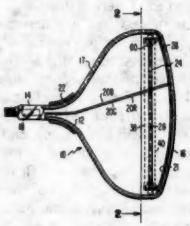
1. An arc tube support of a gaseous-discharge lamp, made from bent wire having a central straight portion extending along an arc tube and end loop-like portions embracing sealed-in ends of the arc tube, characterized in that the loop-like portions are made as spring grips with a single bend releasably embracing the sealed-in ends of the arc tube halfway of the traverse width thereof.

4,602,186

INSULATING MOUNT FOR A CRT EINZEL LENS FOCUS MASK

Kern K. Nan Chang, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 17, 1984, Ser. No. 641,697
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—407 **7 Claims**



1. In a cathode ray tube of the type including an evacuated envelope enclosing a cathodoluminescent screen at one end and an electron gun at an opposing end, a color selection electrode disposed proximate said screen on a first frame, and a pair of focusing meshes disposed on said frame on either side of said color selection electrode; wherein the improvement comprises

support means for supporting said electrode on said frame, said support means including an insulating support tube having an interior surface, and a wire second frame to which said electrode is attached, said support means including an inside insulating support disposed within said tube adjacent to said interior surface such that the ends of

said tube are open, and said second frame having end portions disposed in said inside insulating support.

4,602,187

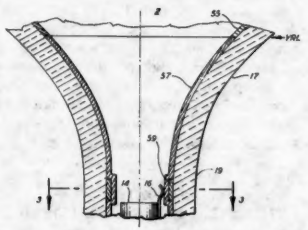
COLOR CRT WITH COMPOSITE ARC SUPPRESSION STRUCTURE

Martin Fischman, Seneca Falls, and Anthony V. Gallaro, Auburn, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,486

Int. Cl.[4] H01J *29/88, 29/92*

U.S. Cl. 313—479 **6 Claims**



1. A color cathode ray tube comprising a glass envelope of integrated neck, funnel and face panel regions, a plural beam electron gun in the neck portion, said gun having a terminal portion including at least one electrical contact means, a phosphor screen having a plurality of phosphor elements on the interior surface of the face panel portion, an aperture mask adjacent the screen for directing the electron beams to the desired phosphor elements, and a composite conductive coating on the interior surface of the glass envelope to provide electrical connection between the terminal portion of the gun and the mask, the composite conductive coating comprising a first coating substantially in the forward portion of the funnel region of the tube and a second arc suppression coating in contact with the first coating and extending substantially into the neck region of the tube, characterized in that:

the composite conductive coating further includes at least one layer of a third coating located beneath the second arc suppression coating, substantially in the area in which the second coating makes electrical contact with the gun, the first and third conductive coating exhibiting a static resistance of from about 600 to 1500 ohms, and the second conductive coating exhibiting a static resistance of from about 2000 ohms to 1 megohm.

4,602,188

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

Johannes T. W. de Hair; Johannes T. C. van Kemenade, both of Eindhoven, and Everhardus G. Berns, Geldrop, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,495

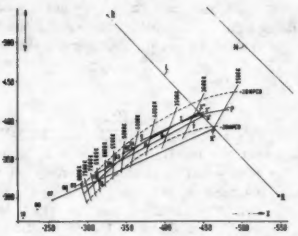
Claims priority, application Netherlands, Jul. 30, 1982, 8203040

Int. Cl.[4] C09K *11/475;* **H01J** *61/48*

U.S. Cl. 313—487 **5 Claims**

1. A low-pressure mercury vapour discharge lamp having a color rendering index R9 of at least 60 and Ra of at least 80, a colour temperature of the emitted white light of at least 2800 K. and a colour point (x_L,y_L) on or not greater than 20 MPCD from the point on the Planckian curve having the same color temperature, said lamp being provided with a gas-tight radiation-transmitting envelope which contains mercury and a rare gas, and which envelope is provided with a luminescent layer containing a luminescent halophosphate, wherein the luminescent layer comprises

a. a luminescent rare earth metal metaborate activated by trivalent cerium and by bivalent manganese having a monoclinic crystal structure, whose fundamental lattice corresponds to the formula $Ln(Mg,Zn,Cd)B_5O_{10}$, in which Ln represents at least one of the elements yttrium, lanthanum and gadolinium and in which up to 20 mol.% of the B may be replaced by Al and/or Ga, which metaborate exhibits red Mn^{2+} emission,



b. a luminescent material which is activated by trivalent terbium and exhibits green Tb^{3+} emission, and

c. at least one luminescent halophosphate of the group which comprises the calcium halophosphates activated by trivalent antimony and by bivalent manganese and emitting white light, whose colour temperature of the emitted radiation is at least 2900 K., and blue-luminescing calcium halophosphate activated by trivalent antimony.

4,602,189

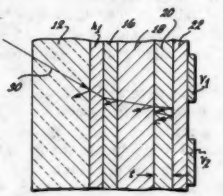
LIGHT SINK LAYER FOR A THIN-FILM EL DISPLAY PANEL

Ramachandra M. P. Panicker, Camarillo, Calif., assignor to Sigmatron Nova, Inc., Thousand Oaks, Calif.

Filed Oct. 13, 1983, Ser. No. 541,702

Int. Cl.[4] H05B *33/22;* **C04B** *35/00;* **H01L** *29/12*

U.S. Cl. 313—505 **8 Claims**



5. A composition of matter consisting of:

a Te-rich semiconductor compound of Cd, Pb, and Te having hole carriers therein; and

a dopant of indium added to said compound;

wherein said indium introduces electrons into the semiconductor compound to neutralize the hole charge carriers therein and thereby increase the specific resistivity of the compound to a level of about 10^6 to 10^7 ohm-centimeter; and

wherein said Pb effectively reduces the mobility of the free charge carriers in the semiconductor compound to thereby further increase the specific resistivity of the compound to a level of about 10^8 to 10^{12} ohm-centimeter.

7. An electroluminescent thin-film display device comprising:

an electroluminescent layer;

a light sink layer on the back of said electroluminescent layer;

a first dielectric layer on the front of said electroluminescent layer;

a second dielectric layer on the back of the said light sink layer;

a first set of transparent electrodes on the front of said first dielectric layer; and

a second set of counter metallic electrodes on the back of said second dielectric layer;

said light sink layer formed of a p-type semiconductor compound comprised of CdTe in combination with PbTe and doped with indium and having an energy band gap for absorbing light in the visible range and a specific resistivity high enough to permit multiplexed drive of said device.

4,602,190

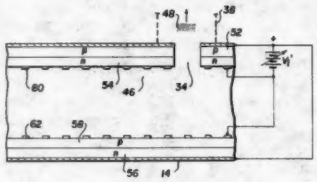
SEMICONDUCTOR MULTIPACTOR DEVICE

Joseph D. Evankow, Jr., Bernardsville, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1984, Ser. No. 612,524

Int. Cl.[4] H01J *7/46*

U.S. Cl. 315—39.63 **7 Claims**



1. A multipactor electronic device, comprising:

multipactor means including an input means, an output means, and an intermediate region of secondary electron emission comprised of at least one layer of n-type semiconductor material having a relatively high secondary emission ratio, said n-type semiconductor material being comprised of gallium phosphide with a layer of cesium;

means coupled to said region of semiconductor material for biasing said material to cause free electrons to accumulate at the surface thereof;

means for coupling an alternating RF input field to said input means for causing said free electrons to form bunches at said onput means; and

means for causing said bunches to be emitted from said output means to an output circuit.

4,602,191

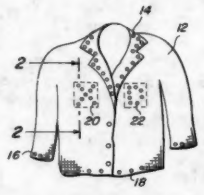
JACKET WITH PROGRAMMABLE LIGHTS

Xavier Davila, 876 E. 180th St., Apt. 5-A, Bronx, N.Y. 10460

Filed Jul. 23, 1984, Ser. No. 633,484

Int. Cl.[4] H01K *7/00*

U.S. Cl. 315—76 **10 Claims**



1. Jacket with programmable lights, comprising, in combination:

(a) a garment, wherein said garment has apertures through which light emitting devices may protrude;

(b) tri-color light emitting diodes defining diode packages emitting three different colors, arranged in any desired pattern, said tri-color light emitting diodes comprising two different colored diodes oppositely connected in parallel to each other, circuit means providing a current to the diodes whose direction is controllable to be either in a first direction wherein one color is emitted, a reverse direction wherein a second color is emitted, and an alternating direction wherein a third color is emitted which is the combination of the first two colors, and wherein said tri-color light emitting diodes protrude through said apertures in said garment,

(c) at least one flexible printed circuit board to which said tri-color light emitting diodes are connected;

(d) a circuit module which programmably controls the emission of said tri-color light emitting diodes, said circuit module comprising a logic control circuit with instructions contained in a program in a storage medium; and

(e) means for temporarily affixing said flexible printed circuit board to the underside of said garment.

4,602,192

THIN FILM INTEGRATED DEVICE

Koji Nomura, Neyagawa; Hisahito Ogawa, Nara; Atsushi Abe, Ikoma, and Tsuneharu Nitta, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

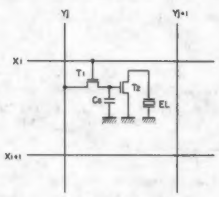
PCT No. PCT/JP84/00145, § 371 Date Nov. 27, 1984, § 102(e) Date Nov. 27, 1984, PCT Pub. No. WO84/03992, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 29, 1984, Ser. No. 678,547

Claims priority, application Japan, Mar. 31, 1983, 58-57552; Jun. 2, 1983, 58-98343

Int. Cl.[4] G09G *3/10*

U.S. Cl. 315—169.3 **14 Claims**



1. A thin film integrated device wherein at least one thin film element is supported on an insulating substrate, characterized in that said thin film element includes a sputtered composite oxide thin film comprising major constituents of at least tantalum and aluminum.

4,602,193

METHOD AND APPARATUS FOR THE STABILIZATION OF DIRECT CURRENT ARC LAMPS

Gabor Patonay, Decatur; Isiah M. Warner, Stone Mountain, and Philip B. Oldham, Atlanta, all of Ga., assignors to Emory University, Atlanta, Ga.

Filed Aug. 10, 1984, Ser. No. 639,383

Int. Cl.[4] H05B *37/00, 39/00*

U.S. Cl. 315—170 **16 Claims**

1. A stabilized DC arc lamp system comprising:

a pair of arc electrodes for producing an arc which gives off light;

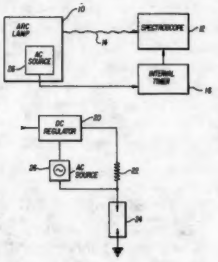
a DC current regulator for providing a direct current to said electrodes to provide power to said arc;

an AC current source having a frequency for providing a small alternating current to said electrodes to be superimposed on said DC current to reduce the wander of said arc with small position fluctuations;

an instrument for receiving said light over a time interval;

a timing means for controlling said time interval to be at least as long as several cycles of said AC current source so that the effect of said AC current on the light intensity is minimized.

12. A method for stabilizing a DC arc lamp which is used as a light source for an instrument, comprising the steps of:



superimposing a small AC current having a frequency on a DC arc lamp current to create small regular fluctuations in the arc position, and variation of intensity of the light received by said instrument;

controlling the testing intervals of said instrument to extend over several cycles of said AC current so that the effect of said variation of intensity will be minimized.

4,602,194

EXCITING CIRCUIT FOR ELECTRONIC FLASH DEVICE

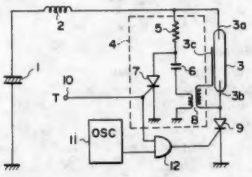
Saburo Numata, Ohmiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,471

Claims priority, application Japan, Jul. 2, 1982, 57-115259

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—241 P **7 Claims**



1. An excitation circuit for an electronic flash tube having a trigger electrode, an anode, and a cathode, comprising

means for generating a trigger pulse of a duration of a trigger time interval;

means responsive to said trigger pulse for imparting a trigger voltage to said trigger electrode;

pulse generator means for generating a series of timing pulses during the existence of each trigger pulse, each timing pulse having a predetermined duration of a brief time interval shorter than the time interval required by the flash tube to operate at its full power;

switching means for turning on and off to close and open the electric circuit for establishing an electric voltage between the anode and the cathode of said flash tube; and

gate circuit means with inputs coupled respectively to receive said trigger pulse and said timing pulses for turning the switching means on only when both the timing pulse and the trigger pulse are occurring, the predetermined duration of the timing pulses and the separation between them being selected for intermittently and repeatedly energizing said flash tube such that the flash tube is energized only at a leading edge portion of its emission characteristic and to a power level below its maximum power level, thereby minimizing the proportion of infrared radiation in the light generated in the photo tube.

4,602,195

INDUSTRIAL ROBOT HAVING INDIVIDUAL ELECTRICAL THREE-PHASE DRIVES

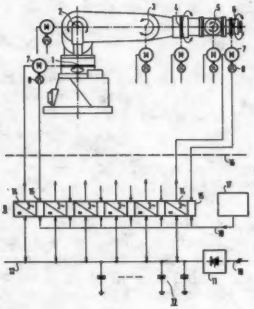
Manfred Eberle, Erlangen, and Rudolf-Peter Hartmann, Oberasbach, both of Fed. Rep. of Germany, assignors to Mantec Gesellschaft für Automatisierungs- und Handhabungssysteme mbH, Fürth, Fed. Rep. of Germany

Filed Mar. 27, 1984, Ser. No. 593,855

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313167

Int. Cl.[4] G05B *11/12*

U.S. Cl. 318—568 **1 Claim**



1. An industrial robot control system having a plurality of individual electrical three-phase drives for controlling movement in respective individual axes, each of said drives comprising:

permanently excited three-phase motor means for controlling movement around an axis;

controlled converter means for a respective one of said motor means for supplying alternating current electrical energy to said motor means;

intermediate direct current link means for supplying direct electrical energy to said controlled converter means;

second converter means for supplying direct current electrical energy to said intermediate direct current link means from a three-phase alternating current network;

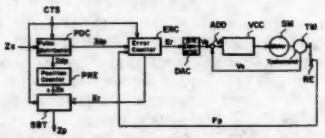
energy storage means coupled to said intermediate direct current link means, said energy storage means storing electric energy produced during dynamic braking of said three-phase motor means;

said controlled converter means further including cascade control means for controlling the position, speed and armature current of said three-phase motor means, said control means comprising first means for comparing an angular position of said robot about an axis with a desired value and for generating, as an output, a desired speed value, second means coupled to said first means for comparing an actual value of the speed of said motor with said desired speed value and for generating, as an output, a current reference value and third means for comparing said current reference value with an actual value of the motor current and for generating, as an output, a control signal, said control signal coupled to a control input of said controlled converter means.

4,602,196
MEASUREMENT METHOD, AND APPARATUS THEREFOR

Mitsuo Matsui, Tokyo, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

Filed May 31, 1983, Ser. No. 499,375
Claims priority, application Japan, May 31, 1982, 57-92301
Int. Cl.[4] G05B 19/28
U.S. Cl. 318—603 5 Claims



1. A method of measuring a coordinate value of a prescribed point on an object by moving a measuring element, driven by a servomotor which generates feedback pulses indicative of an amount of rotation, toward the prescribed point and stopping the measuring element when it contacts the object at the prescribed point, comprising the steps of:

(a) controlling the servomotor so that a difference between a commanded amount of movement, which moves the measuring element toward the prescribed point on the object, and an actual amount of movement of the measuring element, approaches zero;

(b) transporting the measuring element using the servomotor;

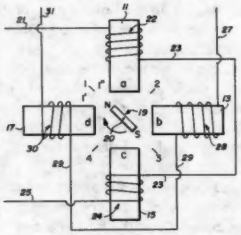
(c) producing an output signal when the measuring element contacts the object at the prescribed point; and

(d) computing, at the instant the output signal is generated, a difference between the commanded amount of movement and a positional deviation, the positional direction being equivalent to a difference between a number of command pulses corresponding to the commanded amount of movement and the number of feedback pulses indicative of an amount of rotation of the servomotor.

4,602,197
STEPPING MOTOR CONTROL SYSTEM

Gary L. Mattson, Thousand Oaks, Calif., assignor to Xebec, San Jose, Calif.

Filed Jan. 14, 1985, Ser. No. 691,228
Int. Cl.[4] H02P 8/00
U.S. Cl. 318—696 9 Claims



1. A method for controlling the operation of a dc stepping motor utilized for positioning a read/write head on a magnetic data storage disk comprising the steps of:

(a) establishing a first magnetic field associated with a winding on a first stationary core member of the stepping motor to draw the rotor of the stepping motor toward a first angular position when the rotor approaches the first position from one predetermined direction of the rotation;

(b) establishing a second magnetic field associated with the winding on the first stationary core member to draw the rotor toward a second angular position adjacent said first angular position but following the same in the direction of rotation, the second magnetic field having the same orientation but a reduced magnitude relative to the first magnetic field; subsequently,

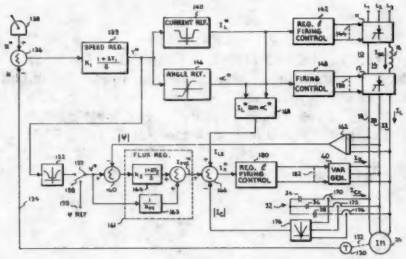
(c) establishing a third magnetic field associated with the winding on the first stationary core member to push the rotor to a third angular position in the same direction of rotation, the third magnetic field having an opposite orientation to the first magnetic field and the same absolute magnitude; then,

(d) establishing a fourth magnetic field associated with the winding on the first stationary core member to draw the rotor to a fourth angular position in the same direction of rotation, the fourth magnetic field having the same orientation but a reduced magnitude relative to the third magnetic field.

4,602,198
INDUCTION MOTOR DRIVE USING LOAD COMMUTATED INVERTER CIRCUIT

Herbert W. Weiss, and Loren H. Walker, both of Salem, Va., assignors to General Electric Company, Salem, Va.

Filed Feb. 26, 1985, Ser. No. 705,961
Int. Cl.[4] H02P 5/40; H02J 3/18
U.S. Cl. 318—798 16 Claims
MICROFICHE APPENDIX INCLUDED
(11 Microfiche, 651 Pages)



1. A system for controlling the operation of an alternating current induction motor having windings supplied with electrical power from a polyphase alternating current power source comprising:

(a) a load commutated inverter circuit connected between the power source and said induction motor for furnishing electrical power to said motor, said load commutated inverter circuit including a controllable alternating current to direct current converter and a controllable direct current to alternating current converter interconnected by a direct current connecting link;

(b) a first feedback control path responsive to a command signal and a feedback signal indicative of a motor operating parameter to control the operation of said alternating current to direct current converter;

(c) a second feedback control path responsive to a command signal to control the operation of said direct current to alternating current converter;

(d) a capacitor circuit connected between said motor windings for supplying reactive volt-amperes to said load commutated inverter circuit and said motor;

(e) a variable VAR generator connected between said motor windings for supplying reactive volt-amperes to said load commutated inverter circuit and said motor in response to a VAR command signal; and,

(f) a third feedback control loop for generating said VAR command signal in response to prescribed operating parameters of said motor.

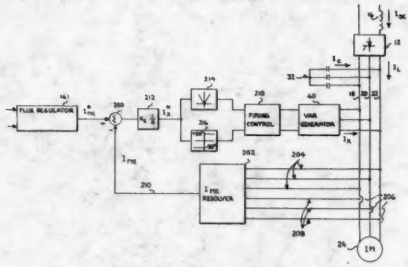
4,602,199

CONTROL FOR INDUCTION MOTOR DRIVE USING LOAD COMMUTATED INVERTER CIRCUIT

Loren H. Walker, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Feb. 26, 1985, Ser. No. 705,963
Int. Cl.[4] H02P 5/40; H02J 3/18
U.S. Cl. 318—798 **18 Claims**

MICROFICHE APPENDIX INCLUDED
(11 Microfiche, 651 Pages)



1. A system for controlling the operation of an alternating current induction motor having windings furnished with electrical excitation from a polyphase alternating current power source comprising:

(a) a controllable load commutated inverter circuit connected between the power source and said induction motor, said load commutated inverter circuit having an output furnishing electrical power to said motor;

(b) a capacitor circuit connected to the motor windings and to the output of said load commutated inverter circuit for furnishing leading reactive volt-amperes thereto;

(c) a variable VAR generator connected to the motor windings and to the output of said load commutated inverter circuit for furnishing an exciting current developing reactive voltamperes thereto; and,

(d) means for controlling of said variable VAR generator comprising:

(1) means for developing a command signal proportional to a motor exciting current required for a desired mode of operation;

(2) resolver means for developing a feedback signal proportional to an actual exciting current furnished to said motor by said load commutated inverter circuit, said capacitor circuit and said variable VAR generator;

(3) means to combine said command signal said feedback signal to generate a signal proportional to the difference therebetween; and,

(4) means responsive to said difference signal to control said VAR generator to reduce said difference signal toward zero value.

4,602,200

ALTERNATING CURRENT MOTOR DRIVE HAVING CURRENT FILTER

Loren H. Walker, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Feb. 26, 1985, Ser. No. 705,920
Int. Cl.[4] H02P 5/40; H02J 3/18
U.S. Cl. 318—798 **14 Claims**

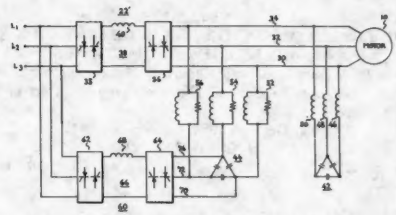
1. An alternating current motor drive system comprising:

a. a controllable power converter connected between a source of electrical power and said motor, said converter having an output for furnishing electrical excitation to the said motor;

b. a VAR generator in circuit with said motor and said power converter for furnishing excitation current to said motor;

c. first and second capacitor circuits in circuit with said motor;

d. a first isolating inductor circuit connected between said first capacitor circuit and said motor; and,



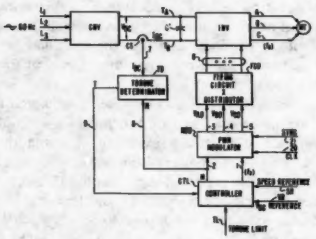
e. a parallel combination of a second isolating inductor circuit and a resistor circuit connected between a common point of said motor and the output of said converter and a common point of said VAR generator and said second capacitor circuit.

4,602,201

PWM MOTOR DRIVE WITH TORQUE DETERMINATION

Charles W. Edwards, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 617,448, Jun. 5, 1984. This application Oct. 9, 1985, Ser. No. 786,163
Int. Cl.[4] H02D 5/40
U.S. Cl. 318—811 **2 Claims**



1. In a pulse-width-modulated (PWM) motor drive including an induction motor; an inverter for supplying AC current to said motor; a voltage-source including first rectifier means supplied with an AC power supply; a DC link between said voltage-source and said inverter for applying a direct current I_{DC} to said inverter; and pulse-width-modulation means for controlling said inverter in accordance with pulse-width-modulated time waves of selected frequency and selected modulation index M; the combination of:

current transformer means coupled with said AC power supply for deriving a vectorial representation of the sum of the AC currents supplied to said first rectifier means;

second rectifier means responsive to said current transformer means for generating a voltage signal representative of said AC currents sum vectorial representation;

said voltage signal being representative of said direct current I_{DC};

operational amplifier means responsive to said voltage signal current representative signal; and

switch means operative on the gain of said operational amplifier means for repeatedly reducing the gain thereof to a lower value determined by the ON and OFF states of said

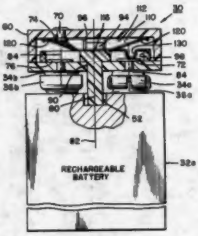
switch means, the duty cycle thereof being in relation to the modulation index M of said pulse-width-modulation means, whereby said operational amplifier means derives an output signal representing I_{DC}/M, said output signal being applied to said motor drive as a torque representative signal.

4,602,202

UNIVERSAL CONNECTOR FOR RECHARGEABLE AND NON-RECHARGEABLE BATTERIES

Glenn R. Mundschenk, and Robert C. Decker, both of Utica, N.Y., assignors to General Electric Company, Portsmouth, Va.

Filed Dec. 10, 1984, Ser. No. 679,905
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—2 **10 Claims**



1. In an electrical product having battery recharging means and a load adapted for energization from a battery, a battery connector comprising:

terminal means adapted to contact the output terminals of either a non-rechargeable battery having a first physical configuration or a rechargeable battery having a second physical configuration, said terminal means coupled to the load of the product such that the load may be energized from either the non-rechargeable battery or the rechargeable battery,

circuit means coupling said terminal means and the battery recharging means, said circuit means including a switch having an open state preventing charging through said circuit means of a battery coupled to said terminal means and a closed state permitting charging through said circuit means of a battery coupled to said terminal means, and

biased actuating means coupled to said switch for moving said switch between its closed and open states, said actuating means adapted to coact with the first physical configuration of a non-rechargeable battery to move said switch against a bias to its open state and adapted to coact with the second physical configuration of a rechargeable battery to allow said switch to move with said bias to its closed state,

whereby the physical configuration of a battery connected to the battery connector determines whether or not the battery will be charged.

4,602,203

INFRARED BATTERY DETECTOR AND CHARGING SYSTEM

Harold W. Bragdon, Topeka, Kans., assignor to Med Care of Kansas, Incorporated, Topeka, Kans.

Filed Nov. 1, 1984, Ser. No. 667,343
Int. Cl.[4] H02J 7/10
U.S. Cl. 320—2 **4 Claims**

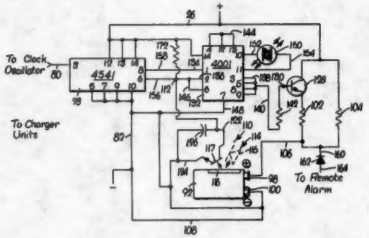
1. A battery charging system operative to a charge a battery having a positive electrical terminal and a negative electrical terminal, said system comprising:

supply means having a pair of output terminals for providing an electrical power output adapted for charging said battery;

support means for receiving said battery in either of a pair of alternate orientations thereof and having a pair of electrical connector means disposed for engagement with said terminals of said battery when the latter is in either of said orientations;

first circuit means for coupling said output terminals of said supply means with said connector means of said support means;

control means operably coupled with said first circuit means and provided with a control input terminal for selectively interrupting said first circuit means;



activating means provided with a sensing signal output terminal means for sensing when said battery is received in said support means in one of said orientations thereof and presenting an output at said sensing signal output terminal said activating means including radiation source means associated with said support means, radiation reflecting means on a portion of said battery, and radiation sensing means associated with said support means operably associated with said sensing signal output terminal: and

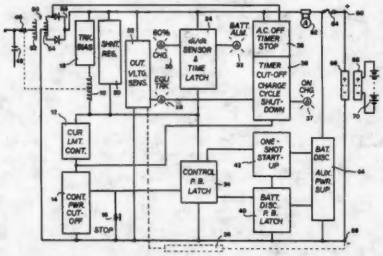
second circuit means for coupling said sensing signal output terminal of said activating means with said control input terminal of said control means for causing the latter to render said first circuit means conductive.

4,602,204

AUTO-START AND MAGNETIC SHUT DOWN BATTERY CHARGING AND SURVEILLANCE CIRCUITS

Alfred M. Hase, 6 Manorwood Road, Scarborough, Ontario, Canada (M1P 4G7)

Filed Feb. 11, 1985, Ser. No. 700,037
Claims priority, application Canada, Nov. 2, 1984, 467001
Int. Cl.[4] H02J 7/10
U.S. Cl. 320—30 **20 Claims**



1. A battery charging and surveillance circuit having full-time battery and circuit operation surveillance, and which is adapted for connection at its input to a source of alternating current electrical energy and at its output to a storage battery;

said battery charging and surveillance circuit having at its input a synchronous switch means having a control coil, where the operation of said control coil controls said synchronous switch means to thereby control the rate of electrical energy input to said storage battery when connected to said circuit;

and where a battery charging operation is automatically initiated when a storage battery is connected to the output terminals of said battery charging and surveillance circuit;

there being an auxiliary power supply circuit within said battery charging and surveillance circuit and across the output thereof, having a capacitor which may be charged to a predetermined bias voltage;

said battery charging and surveillance circuit having an input power transformer to which there is sufficient energy flow at no load conditions of said circuit such that a ripple voltage above a predetermined level appears at said output terminals, and an impedance means to reduce said ripple voltage below said predetermined level when a battery is connected to said output terminals;

a latch circuit connected to said auxiliary power supply, and having a first solid-state device whose base is in series with a zener diode such that the bias voltage on said capacitor is the zener voltage of said zener diode plus the base-emitter voltage of said first solid-state device, and where the bias voltage of said capacitor is sufficient to bias said first solid-state device to a closed, conductive, state;

a one-shot start-up circuit means having a second solid-state device which will be momentarily closed below said zener voltage across said capacitor when the capacitor voltage is collapsing;

a control power cut-off solid-state device in series with said control coil, said cut-off device being biassed to an open, non-conductive, condition when there is no battery load on said battery charging and surveillance circuit;

a second latch which is connected to said one-shot start-up circuit means and to said cut-off device, said second latch being biassed to close said cut-off device when said second solid-state device in said one-shot start-up circuit means closes;

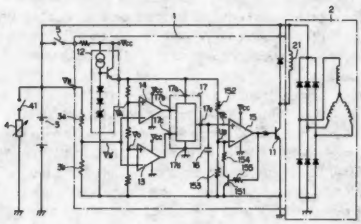
where said impedance means acts to cause collapse of said capacitor voltage when a battery is connected to said output terminals of said battery charging and surveillance circuit.

4,602,205

BATTERY VOLTAGE REGULATING SYSTEM

Hajime Matsuhashi; Toshinori Maruyama, both of Kariya, and Koshi Torii, Iwakura, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 30, 1984, Ser. No. 677,022
Claims priority, application Japan, Dec. 5, 1983, 58-229592
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—64 **4 Claims**



1. A battery voltage regulating system for an automotive vehicle having a battery, an alternator driven by an internal combustion engine mounted on said vehicle and generating an alternating current, a full-wave rectifier for rectifying said alternating current to charge said battery and an electrical load connected to said battery, comprising;

first sensing means connected to said battery for sensing whether a battery voltage exceeds a first reference voltage and for producing a first sensing signal;

second sensing means also connected to said battery for sensing whether said battery voltage exceeds a second reference voltage and for producing a second sensing signal, said second reference voltage being higher than said first reference voltage;

delay means connected to said first and second sensing means and producing a control signal in response to said first and second sensing signals; and

a power transistor connected to a field coil of said alternator and controlling a field current flowing through said field coil in response to said control signal,

wherein said delay means comprises:

a capacitor; and

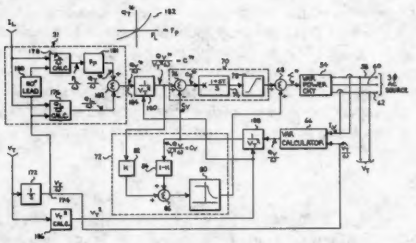
a charge-discharge current changing circuit connected to said first and second sensing means for supplying a charging or discharging current to said capacitor in response to said first sensing signal and for supplying one of charging and discharging currents to said capacitor when said second sensing signal is applied to said charge-discharge current changing circuit, said one of charging and discharging currents determined by said second sensing signal is larger than a corresponding charging or discharging current determined by said first sensing signal so that a delay time determined by said second sensing signal is shorter than that determined by said first sensing signal.

4,602,206

CAPACITANCE CONTROL FOR A STATIC VAR GENERATOR

Loren H. Walker, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Jun. 28, 1983, Ser. No. 508,711
Int. Cl.[4] H02J 3/18
U.S. Cl. 323—211 **47 Claims**



1. A control circuit for a static var generator comprising:

(a) a var generator comprising a force commutated inverter including a plurality of controlled rectifiers coupled to an alternating current source;

(b) means responsive to a gating angle command signal for controlling the firing angle of said controlled rectifiers for generating vars;

(c) means for establishing a capacitance command signal representing the value of an equivalent capacitor required at the existing voltage and frequency of said alternating current source to provide a desired level of compensation; and

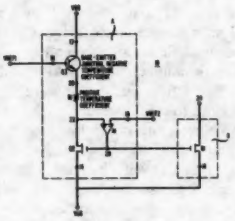
(d) control means coupled to and responsive to said capacitance command signal for generating said gating angle command signal.

4,602,207

TEMPERATURE AND POWER SUPPLY STABLE CURRENT SOURCE

Suk K. Kim, Brooklyn Park, Minn., and Edward J. Zimany, Jr., Morristown, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 26, 1984, Ser. No. 593,522
Int. Cl.[4] G05F 3/16
U.S. Cl. 323—313 9 Claims



1. Circuitry comprising:

a first transistor having a control terminal and first and second output terminals;

a second transistor, of the same type as the first transistor, having a control terminal and first and second output terminals;

resistive means having first and second terminals and characterized by a positive temperature coefficient;

a differential amplifier having a positive and a negative input terminal and an output terminal;

the output terminal of the amplifier being coupled to the control terminals of the first and second devices;

the positive input terminal of the amplifier being coupled to the second terminal of the resistive means and to the first output terminal of the second device;

a p-n junction device having a p-n junction formed at a junction of first and second semiconductor regions, said first and second regions being respectively contacted by first and second terminals of the junction device, said p-n junction being characterized by a negative temperature coefficient, the first terminal of the device being connectable to a first reference potential, the second terminal of the device being coupled to the first terminal of the resistive means, the negative input terminal of the amplifier being connectable to a second reference potential; and

the second output terminals of the first and second transistors being connectable to a first power supply potential.

4,602,208

TEMPERATURE COMPENSATED CURRENT SWITCH

John R. Hines, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

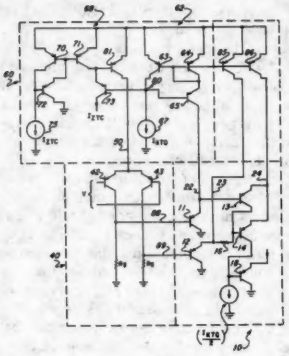
Filed Mar. 29, 1985, Ser. No. 717,740
Int. Cl.[4] G05F 3/20
U.S. Cl. 323—317 8 Claims

1. A current switch whose turn-on and turn-off voltages are independent of temperature, comprising:

a transistor switch circuit having two input transistors to which a differential voltage is applied, two sensing transistors for sensing turn-on and turn-off voltages respectively, and an output transistor controlled by said sensing transistors;

a differential voltage sensing circuit comprising a differential transistor pair, connected to receive the differential voltage at their inputs and to deliver a differential voltage at their outputs for delivery to said transistor switch circuit;

means for supplying a biasing current which varies as a function of temperature to said input and sensing transistors of said transistor switch circuit;



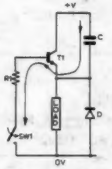
and means for supplying a biasing current which varies as a function of temperature squared to said differential transistor pair of said differential voltage sensing circuit.

4,602,209

SWITCH-OFF CIRCUITS FOR TRANSISTORS AND GATE TURN-OFF THYRISTORS

Barry W. Williams, 108 Princes Gardens, West Acton, London, and Patrick R. Palmer, 394 Newbold Road, Rugby, Warwickshire, both of England

Filed May 1, 1984, Ser. No. 605,804
Claims priority, application United Kingdom, Jun. 24, 1983, 8317178
Int. Cl.[4] H03K 17/60
U.S. Cl. 323—351 5 Claims

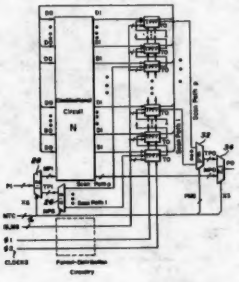


1. A switch-off circuit for a main semi-conductor power switch having two power-conducting terminals and a control terminal, said circuit comprising source terminals for connection to a power source, load terminals for connection to a load, said switch being connected intermediate the source and load terminals such that the two power-conducting terminals of the switch form a series combination with the load terminals connected across the source terminals, said switch having one of its first or second power-conducting terminals at a floating potential and serving to conduct a main current by way of its two power-conducting terminals on application of an "on" drive signal to its control terminal, a capacitor connected in parallel with said two power-conducting terminals of said switch, and a secondary switching device connected to the control terminal of the said switch, whereby, on removal of said "on" drive signal from the control terminal of the said switch, the secondary switching device is turned on and a current is caused to flow from the capacitor to the secondary device by way of the control terminal of the said power switch, thus providing a reverse bias current which rapidly turns off the said switch.

4,602,210
MULTIPLEXED-ACCESS SCAN TESTABLE INTEGRATED CIRCUIT

Patrick P. Fasang, Raleigh, N.C., and John P. Shen, Oakmont, Pa., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 28, 1984, Ser. No. 687,357
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—73 R 9 Claims



1. A testable digital integrated circuit chip having input and output pins, respectively, comprising

(a) a plurality of bistable circuit elements;

(b) a plurality of combinational circuit elements;

(c) first means operable in a mission mode for connecting said bistable and combinational circuit elements to define mission logic means having input and output ends;

(d) second means operable in a test mode for connecting groups of said bistable elements in series to define a plurality of serial scan paths isolated from said combinational circuit elements, each of said scan paths having input and output ends;

(e) first level demultiplexer means having outputs connected with the input ends of said serial scan paths, respectively, said first demultiplexer means having input means;

(f) second level demultiplexer means having first outputs connected with said first demultiplexer input means, respectively, and second outputs connected with the input end of said mission logic functions, respectively, said second demultiplexer means having input means connected with the chip input pins;

(g) first level multiplexer means having a plurality of inputs connected with the output ends of said scan paths, respectively, said first multiplexer means having output means;

(h) second level multiplexer means having first inputs connected with the first multiplexer output means, respectively, and a second set of inputs connected with the output ends of said mission logic functions, respectively, said second multiplexer means having output means connected with the chip output pins;

(i) mode control means for operating said demultiplexing and multiplexing means to switch said integrated circuit between said mission and test modes;

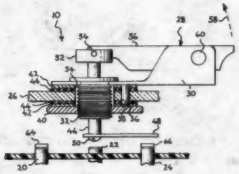
(j) means for applying a test signal to said input pins when said integrated circuit is in the test mode; and

(k) means for monitoring the resultant test signal appearing at the integrated circuit output pins.

4,602,211
MULTIPLE EXTERNAL CONTROL ACTUATOR FOR ELECTRONIC DEMAND REGISTER

Peter F. Losapio, and Warren R. Germer, both of Dover, N.H., assignors to General Electric Co., Somersworth, N.H.

Filed Nov. 10, 1983, Ser. No. 550,408
Int. Cl.[4] G01R *11/64, 11/24;* H01H *3/00;* G06C *15/42*
U.S. Cl. 324—103 R 3 Claims



1. A control actuator for an electronic demand register for an electric meter, said electric meter having a transparent cover thereon, comprising:

at least first and second pushbutton controls disposed in a pattern on said electronic demand register within said transparent cover;

an actuating rod extending through said cover;

an actuating paddle affixed to an inner end of said actuating rod;

said actuating paddle having a width;

lockable means at an outer end of said actuating rod external to said cover, said lockable means including means, effective when locked, for preventing actuation of any of said at least first and second pushbutton controls;

said lockable means further including means, effective when unlocked, for selectively permitting rotation of said actuating paddle into alignment with a selected one of said at least first and second pushbutton controls and for permitting inward actuation of said actuating rod and said actuating paddle toward said selected one;

first and second bosses disposed at a spacing from said first pushbutton control;

said first and second bosses having a height exceeding a height of said first pushbutton; and

said spacing being less than said width whereby said actuating paddle is prevented from entering therebetween and actuation of said first pushbutton control is prevented.

4,602,212
METHOD AND APPARATUS INCLUDING A FLUX LEAKAGE AND EDDY CURRENT SENSOR FOR DETECTING SURFACE FLAWS IN METAL PRODUCTS

Tatsuo Hiroshima, and Tetsuya Hirota, both of Hyogo, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 9, 1983, Ser. No. 502,547
Claims priority, application Japan, Jun. 14, 1982, 57-102600; May 20, 1983, 58-89467; Jun. 7, 1983, 58-102274
Int. Cl.[4] G01N *27/82, 27/90;* G01R *33/12*
U.S. Cl. 324—227 19 Claims

1. A method for detecting surface flaws in a metal test surface, comprising the steps of:

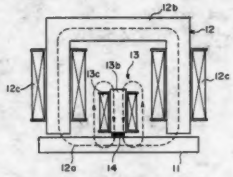
generating a first magnetic field having flux lines parallel to a portion of the test surface;

generating a second magnetic field having flux lines perpendicular to said portion of the test surface, said first and second magnetic fields producing a resultant magnetic field having flux lines passing through said portion of the test surface;

providing magnetic field detector means having a single magnetic field sensor adjacent said portion of the test surface; and

measuring simultaneously with said sensor the magnetic flux leakage caused by surface flaws in said test surface due to

the component of said resultant magnetic field which is parallel to said test surface and the magnetic field created by eddy currents in said test surface generated by the



component of said resultant magnetic field which is perpendicular to said test surface, said eddy currents being disturbed by surface flaws in said test surface.

4,602,213

AUTOMATIC TUNING CIRCUIT FOR NUCLEAR MAGNETIC RESONANCE APPARATUS

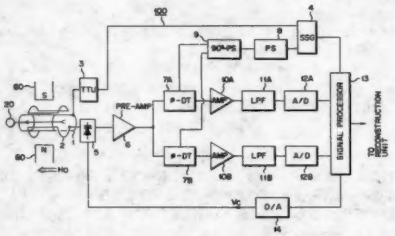
Satoshi Sugiura, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 27, 1983, Ser. No. 565,539

Claims priority, application Japan, Dec. 28, 1982, 57-233506; Dec. 28, 1982, 57-233515

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **16 Claims**



1. An automatic tuning circuit for an NMR apparatus wherein NMR signals are produced in an object under examination by applying thereto magnetic fields in conjunction with RF pulses, said circuit comprising:

receiving coil means for receiving said NMR signals from said object;

quadrature detector means for quadrature-detecting said NMR signals received by said receiving coil means and for obtaining peak values thereof;

control signal generator means for generating a control signal in response to said peak values of said quadrature-detected NMR signals; and

receiver tuning means, including a parallel resonant circuit having a variable capacitance element coupled to said receiving coil means, for automatically controlling said variable capacitance element in response to said control signal to tune said receiver tuning means with respect to said object.

4,602,214

METHODS OF PRODUCING IMAGE INFORMATION FROM OBJECTS

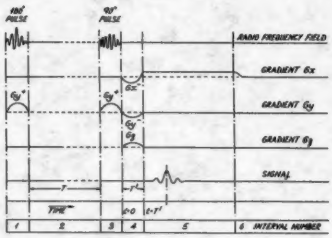
William A. Edelstein, Schenectady, N.Y.; James M. S. Hutchison, Aberdeen, Scotland; Glyn Johnson, Aberdeen, Scotland; Thomas W. T. Redpath, Stonehaven, Scotland, and John R. Mallard, Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 360,953, Nov. 9, 1981, Pat. No. 4,506,222. This application Feb. 15, 1985, Ser. No. 702,126

Claims priority, application United Kingdom, Mar. 14, 1980, 8008773

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **7 Claims**



1. In a method of deriving image formation from an object using nuclear magnetic resonance signals the improvement comprising:

subjecting an object to a continuous static magnetic field along an axis and carrying out a set of sequential steps which comprise:

(1) exciting selected nuclear spins in said object;

(2) applying a phase encoding gradient for phase encoding the said selected nuclear spins in the direction of the phase encoding gradient;

(3) removing the phase encoding gradient and reading out the resultant free induction signal from the said object in the presence of a read gradient of the magnetic field having a gradient direction orthogonal to the phase encoding gradient;

and then successively repeating the above set of sequential steps with different values of amplitude of the phase encoding gradient but with the phase encoding gradient being applied for equal times in each set of steps, there being a recovery interval between the repetition of successive sets of steps.

4,602,215

ELECTROMAGNETIC FIELD METHOD OF DETECTING CONTEMPORARY GEODYNAMIC MOVEMENTS IN MASSIF

Jury S. Ryaboshtan, and Evgeny P. Takhtamirov, both of Donetsk, U.S.S.R., assignors to Tematicheskaya Expeditsia Proizvodstvennogo Obiedinenia "Ukrulegeologia" , Iliicha, U.S.S.R.

Filed May 31, 1983, Ser. No. 499,186

Int. Cl.[4] G01V *3/08*

U.S. Cl. 324—334 **10 Claims**

1. A method of detecting contemporary geodynamics in a massif, comprising the steps of:

marking profiles on a surveyed site of the surface of each massif;

setting up stations on said profiles at a distance of about 5 meters to about 10 meters from each other, each of said stations being a center of a circle with a radius of up to 5 meters;

covering the surface of each of said circles with an information-carrying medium which is highly sensitive to stress fields, said medium comprising isotropic homogenous,

non-magnetic materials having their solid-liquid temperatures in the range of the natural change of temperatures;

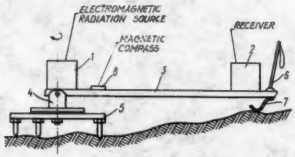
for each of said circles, installing an electromagnetic field source substantially at the center of said circle;

installing an electromagnetic field receiver at the periphery of said circle, said electromagnetic field source and electromagnetic field receiver being arranged along a preset azimuth;

carrying out with said electromagnetic field receiver a set of original measurements at said periphery along various azimuthes of one of the parameters of the electromagnetic field of the information medium;

thereafter, exposing said information medium limited to the area of said circle at least once more to said electromagnetic field;

carrying out repeated measurements along the same azimuthes of the same one of said electromagnetic field parameters of the information medium after a predetermined period of time; and



comparing the results of said set of the original measurements of one of the parameters of said electromagnetic field of said information medium with the results of the repeated measurements of the same parameter of the electromagnetic field of the information medium;

whereby if there are no differences in the results of said set of the original measurements of one of the parameters of said electromagnetic field of the information medium and the repeated measurements of the same parameter of said electromagnetic field of the information medium, the geodynamics of the information medium, and consequently of the massif, is said to be stable, while if the extreme values of said electromagnetic field parameter of the information medium vary, with the receiver-transmitter azimuth being unchanged, the geodynamics of the information medium, and consequently of the massif, is considered active and characterized by compression-tension; while if new extreme values of said electromagnetic field parameter of the information medium appear, with the receiver-transmitter azimuth being changed, the geodynamics of the information medium, and consequently of the massif, is considered active and characterized by shear.

4,602,216

CURRENT MONITORING APPARATUS

Jerry L. Keel, Harvest, Ala., assignor to Avco Corporation, Huntsville, Ala.

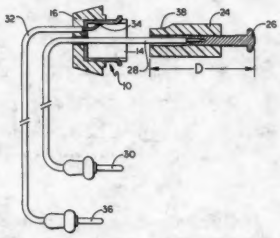
Filed Nov. 4, 1983, Ser. No. 548,692
Int. Cl.[4] G01R *1/04*
U.S. Cl. 324—126 **3 Claims**

1. Apparatus for measuring operating current consumption of an instrument by removing the fuse and fuse retainer cap from the fuse holder of the instrument and inserting therein a probe element which serves to encircuit the terminals of an ammeter with first and second contact locations within the fuse holder that were completed when the fuse was held in place by the cap, the apparatus comprising:

a cylindrical non-conductive cartridge arranged to fit into said fuse holder, said cartridge having an open first end, a hollow central bore and a second end, the second end of said cartridge terminating at a conductive element positioned to make electrical contact with said second contact location in said fuse holder;

a cap arranged to secure said non-conductive cartridge in said fuse holder, said cap having an opening along its central axis and a conductive cup shaped rear member for contacting the first contact location in said fuse holder;

a first test lead having an insulated covering, one end of said test lead passing through the opening in the central axis of said cap thence along the open bore of said cartridge and terminating with electrical connection to said conductive element at the second end of said cartridge, the second



end of said test lead terminating at a test plug which allows ready connection to one terminal of said ammeter; and

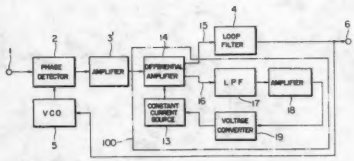
a second test lead having an insulated covering, one end of said second test lead being arranged to be electrically connected to the metal cup shaped member, the second end of said second test lead terminating at a test plug which allows ready connection to a second terminal of said ammeter.

4,602,217

FM DEMODULATOR CAPABLE OF SHIFTING DEMODULATION-BAND CENTER FREQUENCY

Keiro Shinkawa, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,876
Claims priority, application Japan, Nov. 18, 1983, 58-216208; Nov. 18, 1983, 58-216209; Mar. 30, 1984, 59-60650
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—122 **20 Claims**



1. An FM demodulator comprising:

a phase locked loop which is formed by a phase detector to which a frequency modulated signal is inputted, an amplifier, a loop filter, and a voltage controlled oscillator; and

a demodulation band shifting circuit, connected to said phase locked loop, for changing a voltage in said loop in response to the frequency demodulated in said loop, thereby changing the center frequency of a frequency demodulation slope of the loop, said demodulation band shifting circuit including a differential amplifying circuit connected to a constant current source so as to be driven by a constant current.

4,602,218

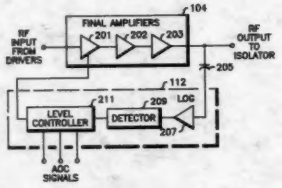
AUTOMATIC OUTPUT CONTROL CIRCUITRY FOR RF POWER AMPLIFIERS WITH WIDE DYNAMIC RANGE

Richard J. Vilmur, Palatine, and Robert F. D'Avello, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1985, Ser. No. 729,016

Int. Cl.[4] H03G *3/30*

U.S. Cl. 330—279 **23 Claims**



1. Circuitry for controlling the magnitude of a radio frequency (RF) signal in response to control signals, comprising:

means, having variable output, for amplifying the RF signal to an output magnitude and for obtaining a sample of said amplified RF signal;

means, coupled to said means for obtaining a sample, for nonlinearly amplifying said sample of said amplified RF signal whereby small values of magnitude of said sample are amplified more than large values of sample magnitude;

means, for rectifying said amplified sample to generate a power magnitude signal having a magnitude related to said RF signal output magnitude;

means for adjusting said power magnitude signal by an adjustment factor selected by the control signals; and

means, responsive to said adjusted power magnitude signal, for varying said variable output amplifying means to produce a corresponding RF signal output magnitude.

4,602,219

JITTER REDUCTION CIRCUIT FOR FREQUENCY SYNTHESIZER

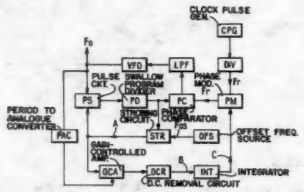
Michael J. Underhill, Horsham, and Richard I. H. Scott, Whitchurch, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 733,397, May 10, 1985, abandoned, which is a continuation of Ser. No. 465,385, Feb. 10, 1983, abandoned. This application Oct. 2, 1985, Ser. No. 783,317

Claims priority, application United Kingdom, Mar. 19, 1982, 8208094

Int. Cl.[4] H03B *19/00*; H03L *7/18*

U.S. Cl. 331—16 **19 Claims**



10. A frequency synthesizer comprising a reference frequency generator and a circuit for producing an output signal the frequency of which has a specific but variable ratio to that of an output signal of the reference frequency generator, which circuit has a first input coupled to an output of the reference frequency generator, a second input for a control signal for the phase of the output signal of said circuit, and an output coupled to an output of the synthesizer, said circuit comprising a frequency divider arrangement having a variable division ratio which determines said specific but variable ratio, which frequency divider arrangement includes means for periodically cancelling an effect which a cycle of an input signal to said arrangement would otherwise have on an output signal of said arrangement, the synthesizer also comprising a coupling to said second input from a point in said circuit at which occurs a signal containing information about jitter which would otherwise occur in the period of the output signal of said circuit due to jitter in the period of the output signal of said frequency divider arrangement, for applying a control signal to said second input to thereby compensate for the jitter which would otherwise occur in the period of the output signal of said circuit, characterized in that said point is one at which occurs a pulse train containing jitter which would otherwise give rise to the jitter in the period of the output signal of the circuit and in that said coupling comprises a d.c. removal circuit followed by an analogue integrator.

4,602,220

VARIABLE FREQUENCY SYNTHESIZER WITH REDUCED PHASE NOISE

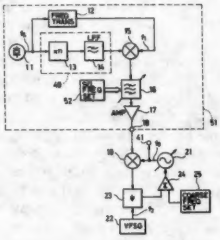
Takenori Kurihara, Gyoda, Japan, assignor to Advantest Corp., Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,502

Claims priority, application Japan, Aug. 22, 1984, 59-127979[U]

Int. Cl.[4] H03L *7/16*

U.S. Cl. 331—19 **20 Claims**



1. A variable frequency synthesizer comprising:

a reference signal source for generating a reference signal of a frequency f_s;

frequency transforming means supplied with the reference signal from the reference signal source for increasing the frequency of the reference signal, said frequency transforming means including a plurality of up-converters, wherein an output of frequency $f_1 = mf_s$ is produced, where m is an integer equal to or greater than 3;

side band signal generating means supplied with the reference signal from the reference signal source for outputting n signals of frequencies f_s, $2f_s$, $3f_s$, . . . and nf_s, wherein n is a positive integer smaller than m, and the degree of generation of phase noise by the side band signal generating means equal to or lower than the degree of generation of phase noise by the frequency transforming means;

a frequency mixer for frequency mixing the output signals of the side band signal generating means and the output of the frequency transforming means; and

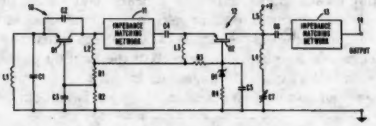
a variable filter for selecting one frequency component $(m \pm n_i)f_s$ from the output of the frequency mixer, wherein, $n_i = 0, 1, 2 \ldots n$.

4,602,221

HIGH FREQUENCY ENERGY SOURCE

Robert J. Regan, Needham; Scott J. Butler, Auburn, and Zvi Ben-Aharon, Framingham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 24, 1984, Ser. No. 685,430
The portion of the term of this patent subsequent to May 22, 2003, has been disclaimed.
Int. Cl.[4] H03B 5/00
U.S. Cl. 331—117 R 15 Claims



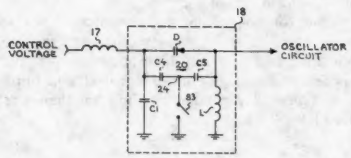
1. A high frequency energy source comprising
an oscillator section for producing a high frequency signal at an output;
an amplifier section having an input coupled to the output of the oscillator section for producing an amplified high frequency signal at an output;
said amplifier section including
an amplifying device having first, second, and third electrodes,
means for connecting the first electrode to a source of dc operating potential, and
dc biasing means connected between the second and third electrodes for producing a dc bias voltage therebetween;
rf connecting means connecting the output of the oscillator section to the input of the amplifier section; and
dc connecting means connecting said dc biasing means of the amplifier section to the oscillator section for providing operating voltage to the oscillator section from said dc biasing means.

4,602,222

CIRCUIT FOR BANDSWITCHING A VOLTAGE CONTROLLED OSCILLATOR

Stephen R. Wynn, Lynchburg, Va., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 19, 1985, Ser. No. 724,977
Int. Cl.[4] H03B 0/00
U.S. Cl. 331—179 7 Claims



1. An oscillator tank circuit for bandswitching a voltage controlled oscillator while keeping control line sensitivity substantially constant comprising:
a varactor for receiving a control line input and for producing an output signal.
a first capacitor connected between said control line input and ground;
a tuning coil connected between said varactor output and ground;
series connected second and third capacitors connected in parallel with said varactor; and
switch means for simultaneously arrayings said second and third capacitors on opposite sides of said varactor while connecting them to ground, thereby increasing the overall tuned capacitance of the circuit while maintaining control line sensitivity.

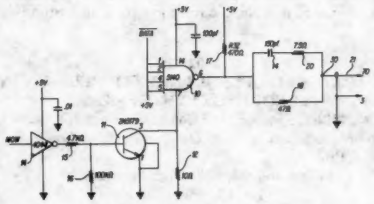
6. An oscillator tank circuit for bandswitching a voltage controlled oscillator comprising:
a varactor electrically coupled between a first grounded capacitor and a grounded tank coil; and
means for simultaneously adding capacitance across said first capacitor and said tank coil while keeping control line sensitivity substantially constant.

4,602,223

HIGH RATE MODULATOR/DEMODULATOR FOR DIGITAL SIGNALS AMPLITUDE MODULATED ON DIGITAL DATA

Robert Goeb, Spotswood, and Luis M. Gaspar, North Arlington, both of N.J., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,449
Int. Cl.[4] H03K 7/02, 9/02
U.S. Cl. 332—9 R 20 Claims



1. A modulator circuit apparatus for modulating a high rate digital data signal with a lower rate digital signal comprising:
first amplifier means having an input adapted to receive said high rate digital data signal, said amplifier having an output terminal and a control terminal adapted to be coupled to a point of reference potential for causing said output terminal to provide an amplified version of said signal at said input terminal according to the status of said control terminal
switching means coupled to said control terminal for selectively providing a ground return for said first amplifier means, said switching means capable of being operated in a first state wherein a given impedance ground return is provided and in a second state wherein a substantially lower impedance ground return is provided,
selection means adapted to receive at an input said lower rate digital signal and having an output coupled to said switching means for controlling the same in said first or second states according to the logic value of said lower rate digital signal whereby said output of said first amplifier means provides an amplitude modulated signal having a modulation index determined by the value of said given impedance of said first state of said switching means.

4,602,224

VARIABLE CAPACITANCE REACTANCE CIRCUIT

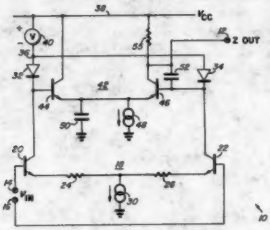
Sohei Arimoto, Yokohama, and Hitoshi Miyashita, Kawaguchi, both of Japan, assignors to Nippon Motorola Ltd., Japan

Filed Dec. 20, 1984, Ser. No. 684,329
Int. Cl.[4] H03B 5/32; H03C 3/20; H03H 11/00
U.S. Cl. 332—16 T 12 Claims

1. A variable reactance circuit having a pair of inputs and an output, comprising:
a first transistor having an emitter, collector and base electrodes, said collector electrode being coupled to the output of the circuit;
capacitive means coupled between said base and said collec-

tor electrodes of said first transistor, said capacitive means having a nominal capacitance value;

variable impedance means AC coupled between said base and said emitter electrodes of said first transistor; and



control circuit means responsive to an applied signal for causing the emitter current of said first transistor and said impedance of said variable impedance means to be varied in direct relationship wherein the output capacitance of the variable reactance circuit is varied accordingly.

4,602,225

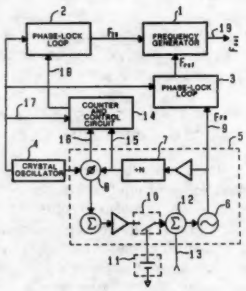
APPARATUS FOR FREQUENCY CORRECTION IN A FREQUENCY SYNTHESIZER

Brian M. Miller, Spokane, and Charles R. Kogler, Liberty Lake, both of Wash., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Jun. 24, 1984, Ser. No. 625,994

Int. Cl.[4] H03C *3/00*

U.S. Cl. 332—19 **2 Claims**



1. A closed loop frequency synthesizer for generating a final output signal, said synthesizer comprising:

frequency generating means responsive to an input signal and a reference signal, said frequency generating means for generating the final output signal;

a first phase-locked loop coupled to the frequency generating means, said first phase-locked loop having a tunable oscillator, said tunable oscillator responsive to a tune voltage on a tune line to adjust the frequency of the tunable oscillator, said first phase-locked loop for synthesizing a first signal having a predetermined frequency when the phase-locked loop is locked, said first signal comprising said reference signal when the first phase-locked loop is locked;

voltage source means for biasing said tunable oscillator;

switching means for unlocking said first phase-locked loop, coupling the tunable oscillator to said voltage source and for making the tune line available for inputting DC frequency modulation signals, said tunable oscillator responsive to said voltage source to generate a second signal having a frequency close to said predetermined frequency, said second signal comprising the reference signal when said first phase-locked loop is unlocked;

control means coupled to the first phase-locked loop, said control means including frequency counter means, said frequency counter means for counting the frequency of said second signal, said control means responsive to said second signal and a third signal, said third signal indicative of said predetermined frequency, said control means providing an error signal indicative of the frequency difference between said second signal and said third signal; and

a second phase-locked loop coupled to said frequency generating means and to said control means, said second phase-locked loop for providing said input-signal, said second phase-locked loop responsive to said error signal to compensate said input signal to correct the final output signal for the effect of the frequency difference in the reference signal when said first phase-locked loop is unlocked.

4,602,226

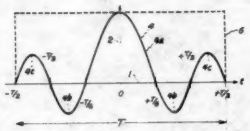
APPARATUS FOR THE GATED MODULATION OF A RADIO-FREQUENCY CARRIER SIGNAL

Dimitrios Vatis, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,406

Int. Cl.[4] H03C *1/00*

U.S. Cl. 332—31 R **23 Claims**



1. Apparatus for the gated amplitude-modulation of a radio-frequency (RF) carrier signal, comprising:

first means for receiving said carrier signal;

second means for receiving a modulation waveform signal;

third means for receiving a gate pulse signal;

output means for providing a modulated and gated RF carrier output signal from said apparatus;

modulator means coupled to said first and second means for providing an amplitude-modulated RF carrier signal having an amplitude substantially equal to the product of the amplitudes of both said RF carrier signal and said modulation waveform signal; and

gate means for connecting said amplitude-modulated RF carrier signal to said output means with relatively low attenuation and relatively high attenuation, respectively, responsive to said gate pulse signal at said third means being respectively greater than and less than a predetermined level.

4,602,227

COAXIAL LC PHASE-SHIFTER FOR PHASE-CONTROLLED TELEVISION BROADCAST SWITCHING CIRCUIT

Raymond N. Clark, Cherry Hill, and Anthony N. Schmitz, Mt. Laurel Township, Burlington County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 30, 1984, Ser. No. 635,926

Int. Cl.[4] H01P *5/16;* **H03H** *7/48*

U.S. Cl. 333—109 **18 Claims**

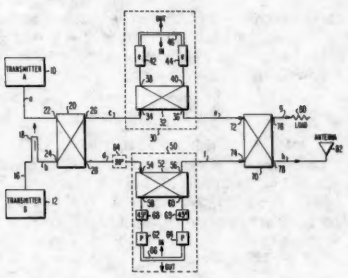
1. An arrangement for controlling high-power, high-frequency first and second signals from first and second sources, respectively, for switching said first and second signals between first and second loads in a first mode of operation and

for combining said first and second signals and applying the resulting combined signal to one of said first and second loads in a second mode of operation, said arrangement comprising:

a first coupler comprising first, second, third and fourth ports, said first and second ports being input ports coupled to said first and second sources, respectively, and said third and fourth ports being output ports, each of which produces a combination signal resulting from a combination of said first and second signals;

second and third couplers, each having an input port, an output port, and third and fourth additional ports, said input ports of each of said second and third couplers being coupled to said third and fourth output ports of said first coupler, respectively, for providing phase-shifts to said respective combination signals as they pass between said input and output ports of each of said second and third couplers;

a fourth coupler comprising first and second input ports coupled to said output ports of said second and third couplers, respectively, for receiving phase-shifted combination signals therefrom, and further comprising a first output port coupled to said first load and a second output port coupled to said second load; and



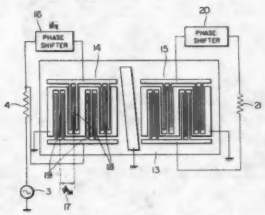
reactive terminating means coupled to said third and fourth additional ports of said second and third couplers for controlling the magnitude of said phase-shifts for selecting one of said first and second modes of operation, said reactive terminating means comprising first and second pairs of coaxial inductance-capacitance circuits, said first pair of coaxial inductance-capacitance circuits being coupled to said third and fourth additional ports of said second coupler, said second pair of coaxial inductance-capacitance circuits being coupled to said third and fourth additional ports of said third coupler, each of said coaxial inductance-capacitance circuits including elongated coaxial transmission-line means including an outer conductor without a gap, first and second portions of a hollow inner conductor concentric with said outer conductor, said first portion of said inner conductor being axially separated from said second portion of said inner conductor by a non-conductive gap, and the end of said second portion of said inner conductor remote from said gap being short-circuited to said outer conductor, the length of said second portion being less than one-quarter wavelength at said high frequency.

4,602,228

SURFACE ACOUSTIC WAVE FILTER

Jun Yamada, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 672,205
Claims priority, application Japan, Nov. 30, 1983, 58-224188
Int. Cl.[4] H03H *9/64*
U.S. Cl. 333—194 **5 Claims**



1. A surface acoustic wave filter comprising:

a substance for propagating surface acoustic waves;

at least one interdigital input transducer, formed on said substrate, which is adapted for connection to a signal source and for conversion of an electrical signal from said signal source into a surface acoustic wave;

at least one interdigital output transducer, formed on said substrate, which is adapted for connection to a load and for conversion of said acoustic surface wave into said electric signal; and

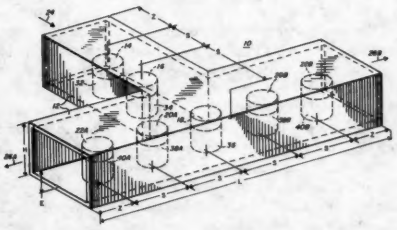
at least one of said interdigital input and output transducers including an interdigital sending electrode part and an interdigital reflection electrode part, said interdigital sending and reflection electrode parts being arranged to provide a geometrical phase difference ϕ_M radians when said acoustic surface wave travels a predetermined distance between respective centers of said sending and reflection electrode parts and interconnected through phase shifter means which provides an electrical phase difference ϕ_E radians therebetween, the sum $(\phi_M+\phi_E)$ of said phase differences being a value within a range from 0 to 2π radians other than a value of π radians.

4,602,229

RESONANT BANDPASS T FILTER AND POWER SPLITTER

Francis R. Yester, Jr., Arlington Heights, and Mark A. Gannon, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1983, Ser. No. 567,436
Int. Cl.[4] H01P *1/203, 1/208, 1/201*
U.S. Cl. 333—208 **13 Claims**



1. A T-filter and power splitter/combiner comprising:

a first filter having a resonant center frequency, further comprising a plurality of resonant elements; and

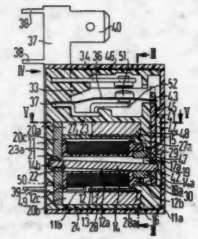
a second filter having substantially the same resonant center frequency as that of the first filter, further comprising a plutality of resonant elements, at least one of the resonant elements of the second filter comprising one of the resonant elements of the first filter.

4,602,230

POLARIZED ELECTROMAGNETIC RELAY

Helmut Schedele, Diessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,289
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347602
Int. Cl.[4] H01H 51/22
U.S. Cl. 335—79 20 Claims



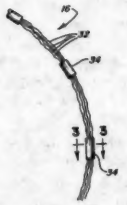
1. In a polarized relay having a base body; a coil being secured in the base body and having a coil body with an axially extending passage, first and second end flanges and a winding on the coil body between the flanges; a bar-shaped armature being received inside the passage of the coil body on an axis thereof and being pivotally mounted adjacent the first flange to enable pivotal movement thereof; a permanent magnet arrangement having two pole plates which are on a common plane extending parallel to the coil axis, each pole plate adjacent the second flange having end portions extending at right angles to the common plane to provide spaced surfaces having an air gap for a free end of the armature to extend into said magnet arrangement including a flux plate having a portion extending perpendicular to the coil axis and having a segment extending parallel to the pole plates and coacting with the pole plates to form a space for receiving each magnet of the arrangement; at least one stationary contact element anchored in the base body and at least one movable contact element being moved by that armature between a position out of engagement with the associated stationary contact and a position engaging the stationary contact; the improvements comprising actuating means for transferring movement of the armature to the movable contact element, said magnet arrangement having a portion on both sides of the coil, each portion of the arrangement including one pole plate and a narrow segment of the flux plate extending parallel thereto to form a space for receiving a double pole permanent magnet, at leas one permanent magnet being provided in one of the two spaces, said armature being mounted for pivotal movement in a recess in the portion of the flux plate and wherein said base body has recesses and slots for receiving each of the parts of the relay including the coil body, the contact elements, said flux plate, each permanent magnet and the two pole plates so that the parts of the relay are assembled by being plugged into the base body.

4,602,231

SPACED STABILIZING MEANS FOR A SUPERCONDUCTING SWITCH

John R. Purcell, San Diego, and Yen-hwa Hsu, Solana Beach, both of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Jul. 20, 1984, Ser. No. 632,813
Int. Cl.[4] H01F 7/22
U.S. Cl. 335—216 8 Claims



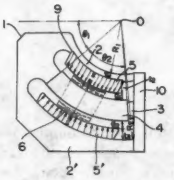
1. A switch comprising:
a length of superconductive material comprising a plurality of filaments and having a transition temperature;
stabilizing means comprising a plurality of segments of normally conductive material spaced from one another along said length of superconductive material and in contact therewith so as to connect said filaments in parallel; and
means for varying the temperature of said superconductive material between respective temperatures above and below its transition temperature.

4,602,232

ELECTROMAGNETIC DRIVE UNIT

Teruo Umehara, and Norio Matsumoto, both of Saitama, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 10, 1985, Ser. No. 732,695
Claims priority, application Japan, May 16, 1984, 59-97862
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—222 5 Claims



1. In an electromagnetic drive unit comprising:
a substantially E-shaped yoke having an arc-shaped center yoke, a first circular arc shaped side yoke disposed on the inside of said center yoke, and a second circular arc shaped side yoke disposed on the outside of said center yoke, said center, said first, and said second yokes having a common axis;
a first arc-shaped permanent magnet fixed to said first side yoke so as to form a first magnetic gap inside said center yoke;
a second arc-shaped permanent magnet fixed to said second side yoke so as to form a second magnetic gap outside said center yoke; and
a movable coil member disposed in said magnetic gaps,
wherein said first and second permanent magnets are magnets provided with anisotropy in directions which are different with each other, so that the magnetic flux density in said first magnetic gap is substantially equal to that in said second magnetic gap.

4,602,233

APPARATUS FOR TRANSMITTING FORCE FROM ACTUATING ELEMENT OF AN ELECTROMAGNET TO A COMPONENT

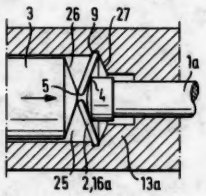
Rudolf Pavlovsky, Plattenweg 53, CH-8200 Schaffhausen, Switzerland, and Pavel Drazan, 67, Millrace Close, Lisvane, CF4 & UQ Cardiff, United Kingdom

Filed May 23, 1985, Ser. No. 737,199

Claims priority, application Switzerland, May 24, 1984, 2539/84

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—258 12 Claims



1. An apparatus for transmitting force from an actuating element of an electromagnet to a component to be actuated, said element and said component being substantially axially aligned, comprising a lever mechanism interposed between said element and said component, said lever mechanism including at least one lever rotatable about a stop and having a point of contact with said element and a point of contact with said component, wherein a mechanical advantage greater than one is provided when said point of contact with said element is closer to the axis of said component than said point of contact with said component, and wherein a mechanical advantage less than one is provided when said point of contact with said component is closer to said axis of said component than said point of contact with said element.

4,602,234

COIL ARRANGEMENTS

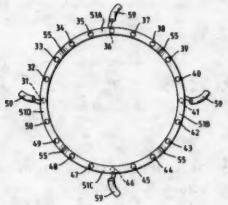
Peter C. Butson, Harrow, England, assignor to Picker International, Limited, Wembley, England

Filed Feb. 21, 1985, Ser. No. 703,897

Claims priority, application United Kingdom, Feb. 27, 1984, 8405066

Int. Cl.[4] H01F *5/00*

U.S. Cl. 335—299 10 Claims



1. A high frequency coil arrangement for use in generating and detecting nuclear magnetic resonance in a body comprising: a plurality of non-magnetic, electrically conductive paths extending generally parallel to the axis of a generally cylindrical volume and disposed around the volume; means interconnecting said paths at each of their ends, at least in respect of the passage of currents at said high frequency; first coupling means for causing currents corresponding to a high frequency input signal to flow in loops formed by said paths and interconnection means which embrace said volume, thereby to produce a magnetic field in the volume in a given direction substantially perpendicular to the axis of said volume; and second coupling means for applying to detecting means a signal corresponding to the current in at least one said path in which the induced current in the prersence of said field is substantially zero.

4,602,235

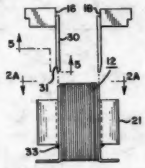
TRANSFORMER ASSEMBLY WITH TERMINAL PLATES IN SUPPORT

Victor A. D. Howard, West Chicago, and William A. Heitmanek, Elmhurst, both of Ill., assignors to Micron Industries Corp., Stone Park, Ill.

Filed Aug. 20, 1984, Ser. No. 642,198

Int. Cl.[4] H01F *15/10*

U.S. Cl. 336—192 4 Claims



1. A transformer comprising:

a core having an extending member or leg;

a coil winding positioned around said leg and including connecting leads, and forming a spacing between the core and the inner surface of said coil winding;

an inverted L-shaped terminal support of non-conductive material having an upper body portion and a downwardly-extending leg, said downwardly-extending leg being received in friction-fit relation between said core and coil in said spacing;

said body portion being sub-divided into a plurality of compartments;

terminal plates conforming substantially to the size of said compartments, each of said plates including a front end having a flat section and downwardly-angled tines,

said compartments having a front wall providing an upper support surface and a vertical surface, a back wall and side walls, said back wall including an overhang for engaging the back portion of said plate along its upper surface, said downwardly-angled tines being wedged and snapfittable against the vertical surface of said front wall, and said flat section engaging the upper surface of said front wall to thereby position said plates securely in respective compartments.

4,602,236

LAMINATED BALLAST CORE

Billy L. Shelby, and James R. Wirt, both of Memphis, Tenn., assignors to FL Industries, Inc., Livingston, N.J.

Filed Feb. 8, 1985, Ser. No. 699,725

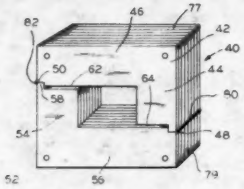
Int. Cl.[4] H01F *27/24*

U.S. Cl. 336—216 11 Claims

1. A lamination core for use in a ballast, said lamination core comprising a plurality of nearly identically shaped lamination pieces, about one-half of said lamination pieces being stacked adjacent each other to form a generally L-shaped upper lamination section and the other half of said lamination being stacked adjacent each other to form a generally L-shaped lower lamination section, said upper lamination section being abuttingly placed in contact with and on top of said lower lamination section to form a complete lamination core;

said lamination core forming a generally rectangular box which has a rectangular opening through the center axis thereof;

each of said sections having a tab at one free end thereof and an indentation at another;



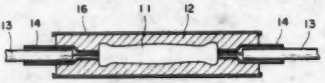
said tab of one section being welded to at least one engaging surface of the indentation of another section and forming a straight gap between adjacent ends of said sections.

4,602,237

BALLAST RESISTOR DEVICE FOR USE IN A LASER SYSTEM

Iwao Hamaguchi, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 648,055
Claims priority, application Japan, Sep. 6, 1983, 58-163499
Int. Cl.[4] H01C *7/10, 7/13*
U.S. Cl. 338—20 **10 Claims**



1. A ballast resistor device for use in a laser system, comprising:

a housing of a predetermined shape;

a ballast resistor element placed within a space defined by said housing and having a pair of leads, each connectable to a cable for connection to circuitry in said laser system;

a filler material filled in the space between said housing and said ballast resistor element thereby having at least said ballast resistor element embedded in said filler material; and

means for fixing an assembly of said housing, ballast resistor and filler material to a mounting member in said laser system.

4,602,238

INFRARED PANEL EMITTER AND METHOD OF PRODUCING THE SAME

Edward J. Furtek, Salisbury, Mass., assignor to Vitronics Corporation, Newmarket, N.H.

Filed Jan. 20, 1984, Ser. No. 572,362
Int. Cl.[4] H01C *1/026*
U.S. Cl. 338—236 **24 Claims**

1. An infrared panel emitter comprising:

an insulating layer;

a secondary emitter comprising an electrically insulating, high emissivity material;

a metal foil having an etched pattern for emitting primary infrared radiation positioned between said insulating layer and said secondary emitter, said metal foil being formed independently of both said secondary emitter and said insulating layer and not being secured directly thereto to permit said metal foil to expand and contract freely with respect to said insulating layer and said secondary emitter;

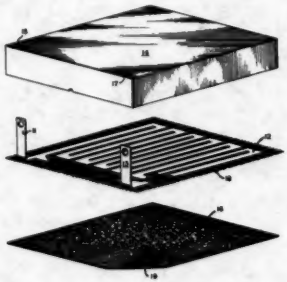
the primary radiation being reflected by said insulating layer and absorbed by said seco..dary emitter and said secondary emitter emitting secondary infrared radiation from a secondary emitting surface thereof;

a void adjacent one entire lateral surface of said metal foil to permit thermal expansion and contraction of said metal foil; and

means for securing together said insulating layer and said secondary emitter to capture said metal foil therebetween.

13. A method for producing an infrared panel emitter comprising:

forming a composite of a mesh sheet having openings and means for emitting primary infrared radiation having openings;



placing an insulating layer for reflecting said primary radiation adjacent one surface of said composite;

locating an electrically-insulating, high emissivity material adjacent the opposite surface of said composite to form an assembly, said material having a secondary infrared emitting surface on the side opposite of said composite;

securing together said insulating layer and said high emissivity material to capture said composite therebetween; and

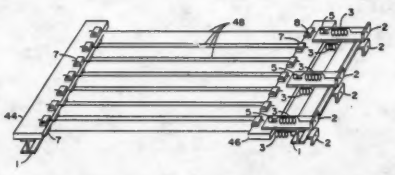
heating said assembly to vaporize said mesh sheet.

4,602,239

SPRING TENSIONED WIRE RESISTANCE HEATER

J. Cletus Harper, Huntsville, Ala., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 338,442, Jan. 8, 1982, abandoned. This application Oct. 29, 1984, Ser. No. 665,903
Int. Cl.[4] H01C *10/16*
U.S. Cl. 338—316 **7 Claims**



1. In an apparatus for heating a substrate comprising a plurality of electroconductive heating wires in substantially parallel, spaced relationship attached at one end to a bus bar capable of connection to a voltage source and at the other end to a bus bar capable of being grounded, wherein one of the bus bars is attached to a tensioned spring to prevent sagging of the wires as the wires expand upon heating, the improvement which comprises

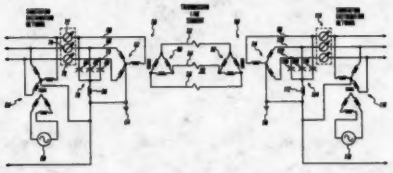
attaching said spring in a state of tension at one end to a stationary member of the apparatus and at the other end to a bus bar which is movable in a plane parallel with the plane of said heating wires and is positioned in contact with a stationary member of the apparatus which limits its movement to said plane.

4,602,240

APPARATUS FOR AND METHOD OF ATTENUATING POWER LINE CARRIER COMMUNICATION SIGNALS PASSING BETWEEN SUBSTATION DISTRIBUTION LINES AND TRANSMISSION LINES THROUGH SUBSTATION TRANSFORMERS

William C. Perkins, Sachse, Tex., and Keh-Wen Whang, St. Louis, Mo., assignors to General Electric Company, King of Prussia, Pa.

Filed Mar. 22, 1984, Ser. No. 592,139
Int. Cl.[4] H04M *11/04;* **H01F** *33/00, 40/10*
U.S. Cl. 340—310 R **9 Claims**



1. The method of reducing crosstalk between three-phase power line carrier transceivers situated at two remote three-phase substation electric power distribution networks that are electrically interconnected through (i) a three-phase transmission line and (ii) substation transformers at opposite ends of the transmission line, where the transceivers are intended to communicate only with other communication devices within a given substation power distribution network, comprising the steps of:

capacitively coupling each of the three-phase lines of each distribution network together in a wye connection to form a capacitor bank at a point between the transceiver and the substation transformer at each substation experiencing substantial crosstalk where the capacitive values are such as to substantially block signals at the electric power frequency and provide substantially no blocking effect at the transceiver carrier frequency; and

connecting the common point of said wye-connected capacitor bank to neutral through a shunt inductance where the inductance is of such a value that there is a high ratio of desired communication signal to crosstalk communication signal, the capacitor bank and shunt inductance at each distribution network at each end of the interconnecting electrical transmission line along with the intermediate reactances connecting the capacitor banks forming a three-phase balanced pi communication frequency attenuation circuit in which the capacitor bank and the associated shunt inductance at each distribution network form a series combination that is in shunt relationship with the main path of the communications signal in the associated distribution network.

4,602,241

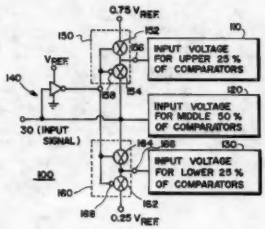
INPUT CURRENT SAVING APPARATUS FOR FLASH A/D CONVERTER

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 28, 1985, Ser. No. 749,858
Int. Cl.[4] H03M *00/00*
U.S. Cl. 340—347 AD **7 Claims**

1. In a flash analog-to-digital converter including a first source of an input signal and a second source of a plurality of incrementally ascending reference voltages; said converter further having first and second group of comparators, each of which is arranged to be alternately coupled with said input signal and a respective one of said reference voltages; said first and second group of said comparators being respectively coupled to the upper 50% and lower 50% of reference voltages; an improvement for limiting the loading on said sources of input signal and reference voltages comprising:

sensing means for determining whether said input signal is above or below the midpoint of said plurality of reference voltages; and


0.75 VREF
VREF
30 (INPUT SIGNAL)
0.25 VREF
INPUT VOLTAGE FOR UPPER 25 % OF COMPARATORS
INPUT VOLTAGE FOR MIDDLE 50 % OF COMPARATORS
INPUT VOLTAGE FOR LOWER 25 % OF COMPARATORS

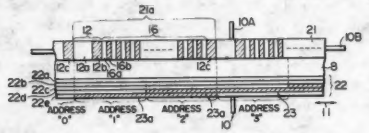
switching means coupled to said midpoint sensing means for selectively applying said input signal to one of said first and second group of comparators and an appropriate fixed voltage to the other of said first and second group of comparators.

4,602,242

ENCODER FOR PHOTOELECTRIC MEASURING DEVICES

Kazuaki Kimura, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 407,342, Aug. 12, 1982, abandoned.
This application Sep. 11, 1985, Ser. No. 774,859
Claims priority, application Japan, Aug. 13, 1981, 56-126013
Int. Cl.[4] G01D *5/34;* **H03K** *13/00, 13/18*
U.S. Cl. 340—347 P **2 Claims**



1. An encoder comprising a code carrying medium movable with respect to photoelectrical sensor means in one direction, said code carrying medium having a first track formed with a plurality of first blocks arranged along said direction of movement of the code carrying medium, each of said first blocks carrying address information of the particular block recorded in a direction crossing said direction of movement of the code carrying medium, and a second track parallel with said first track and formed with a plurality of second blocks arranged along said direction of movement, each of said second blocks carrying reference position information representing a reference position of the particular one of said second blocks and a plurality of coded bar patterns arranged with a first predetermined effective pitch in series along said direction of movement of said code carrying medium, said photoelectrical sensor means having a plurality of sensing elements arranged in series with a second predetermined effective pitch which is slightly different from said first predetermined pitch of said coded bar patterns to produce a vernier relationship with said coded bar patters, said photoelectrical sensor means being arranged with respect to said code carrying medium so that the sensing elements in said sensor means read the information and patterns on said code carrying medium to produce an output representing a relative movement between said code carrying medium and said photoelectrical sensor means, said sensing elements in said photoelectrical sensor means being arranged so that they read directly an image of one of said first and second blocks,

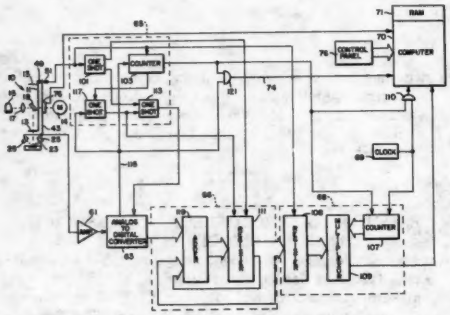
and further comprising reflecting means for rotating an image of the other of said first and second blocks so that said address information on said first track and said patterns and information on said second track can be read by said sensing elements.

4,602,243

ANALOG-TO-DIGITAL CONVERSION AND AVERAGING SYSTEM FOR AN OPTICAL ANALYZING INSTRUMENT

Kenneth P. Von Bargen, Berwyn Heights, and Kenneth A. Taschner, Frederick, both of Md., assignors to Pacific Scientific Company, Anaheim, Calif.

Filed Apr. 27, 1983, Ser. No. 489,022
Int. Cl.[4] H03K *13/02, 5/00;* G01J *3/511*
U.S. Cl. 340—347 AD **12 Claims**



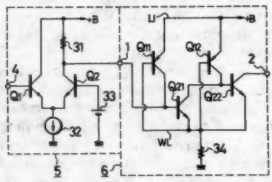
1. An analog-to-digital conversion and averaging system comprising a source of variable analog signals, a source of repeating sampling signals produced simultaneously with said analog signal, means responsive to each sampling signal to perform a plurality of successive analog-to-digital conversions on said analog signal prior to the next sampling signal produced by said source of sampling signals, and accumulator means to determine the sum of the successive conversions of each plurality of conversions produced in response to each sampling signal.

4,602,244

INTEGRATED INJECTION LOGIC CIRCUIT

Yoshiyuki Takayanagi, and Masashi Takeda, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 27, 1984, Ser. No. 604,486
Claims priority, application Japan, May 9, 1983, 58-80621; May 9, 1983, 58-68940[U]
Int. Cl.[4] H03M *1/12*
U.S. Cl. 340—347 DA **17 Claims**



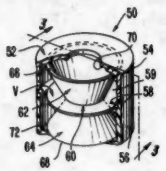
1. An integrated injection logic circuit comprising:
at least one constant current source transistor;
at least one switching inverter transistor;
an injector connected directly to a first reference potential; and
a wall connected indirectly to a second reference potential.

4,602,245

GENERAL PURPOSE MODULAR ACOUSTIC SIGNAL GENERATOR

Ta-Lun Yang, Rockville, Md., and Paul Broome, Luray, Va., assignors to Ensco, Inc., Springfield, Va.

Filed Apr. 29, 1983, Ser. No. 490,024
Int. Cl.[4] G08B *3/00;* H02N *1/04;* H04R *15/00*
U.S. Cl. 340—384 R **15 Claims**



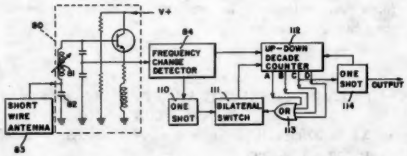
1. A general purpose modular acoustic generator comprising:
a separable outer casing unit which includes a plurality of separate hollow casing sections and coupling means for detachably securing said hollow casing sections together in a manner defining a chamber;
an insert unit removably positioned in said chamber of the outer casing unit; and
an acoustic vibration producing means removably mounted within said chamber of the outer casing unit;
said outer casing unit being provided with at least one aperture that is positioned in coordination with the position of said insert unit in a manner creating at least one Helmholtz resonator; said insert unit having a tubular section, one open end of which provides support for the acoustic vibration producing means and an opposite end of which surrounds said aperture; and said acoustic vibration producing means being supported within the chamber by said insert unit in a manner for producing a selected output frequency from the acoustic generator.

4,602,246

INTRUDER DETECTOR APPARATUS

Garold K. Jensen, 1024 Falcon Dr., River Falls, Wis. 54022

Division of Ser. No. 347,952, Feb. 11, 1982, Pat. No. 4,536,747.
This application Apr. 8, 1985, Ser. No. 720,581
Int. Cl.[4] G08B *19/00, 13/18*
U.S. Cl. 340—521 **10 Claims**



1. A detection device for sensing motion, comprising:
means for generating an electromagnetic field;
capacitance means associated with said generating means responsive to disturbances of said electromagnetic field;
self-excited oscillator means connected to said capacitance means and operative for providing a signal having a fre-

quency which varies in response to disturbances in said electromagnetic field;

frequency change detector means connected to receive said variable frequency signals from said oscillator and operative to provide an output signal upon detection of changes in said frequency, and including means for suppressing output upon detection of repetitive oscillations of the frequency value; and

discriminating means connected to receive the output of said frequency change detector, and operative for providing an output signal upon occurrence of a predetermined number of outputs of said frequency change detector means within a predetermined time interval.

4,602,247

METHOD AND SYSTEM FOR DETECTING DRIVER FATIGUE INCLUDING DIFFERENTIATION OF EFFECTS OF REST PERIODS

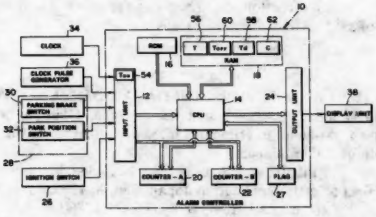
Yasutoshi Seko, Yokohama; Haruhiko Iizuka, Yokosuka; Takayuki Yanagishima, Yokosuka, and Hideo Obara, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 15, 1984, Ser. No. 580,176

Claims priority, application Japan, Feb. 18, 1983, 58-22818[U]; Feb. 18, 1983, 58-22819[U]

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—575 **14 Claims**



9. A fatigue alarm method for an automotive vehicle driver comprising the steps of:

measuring the periods of time for which an automotive vehicle is moving and at rest;

comparing the measured rest periods of the vehicle with a first predetermined threshold value;

adding the rest periods to the moving periods when the rest periods do not exceed said first threshold value to obtain an accumulated driving time value;

subtracting the rest periods from said accumulated driving time value when the rest periods exceed said first threshold value to update said driving time value; and

notifying the driver of the vehicle of excessive fatigue when the updated driving time value exceeds a second predetermined threshold value.

4,602,248

ELECTRICAL ATMOSPHERIC PRESSURE ALARM

Michael L. Foster; Harold L. Foster, both of 514 W. Nodaway, and Michael A. Powers, 312 E. Chestnut St., all of Clarinda, Iowa 51632

Filed Mar. 11, 1985, Ser. No. 710,459

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—601 **5 Claims**

1. An atmospheric pressure actuated alarm comprising:

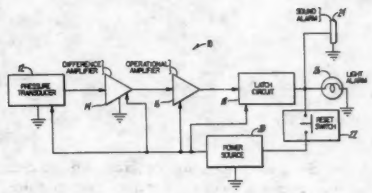
a pressure transducer adapted to sense changes in atmospheric pressure and to produce an electrical transducer signal in response thereto;

a difference amplifier connected to said pressure transducer for measuring said transducer signal and being adapted to produce an output signal whenever said transducer signal is of a predetermined magnitude resulting from exposure of said transducer to the atmospheric pressure change caused by a tornado;

an operational amplifier connected to said difference amplifier for producing an amplified signal corresponding to said output signal received from said difference amplifier;

latch means connected to said operational amplifier for receiving said amplified signal;

signal means connected to said latch means and being capable of actuation to cause a humanly perceptible warning signal; p1 a power source connected in series with said latch means and said signal means;



said latch means being changeable from an open condition to a closed condition in response to said amplified signal being greater than a predetermined magnitude whereby said power source will be placed in electrical connection with said signal means to cause actuation of said signal means;

said pressure transducer, said difference amplifier, said operational amplifier, and said latch means comprising solid state circuitry and being free from moving parts.

4,602,249

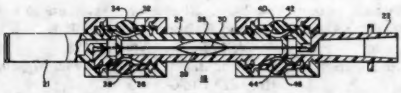
METHOD AND APPARATUS FOR DETECTING LEAKING VALVES IN A VOLUMETRIC INFUSION DEVICE

Martyn S. Abbott, Garland, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.

Filed May 21, 1984, Ser. No. 612,375

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—605 **6 Claims**



1. Apparatus for detecting leaking valves in a volumetric fluid delivery device employing a metering chamber of predetermined volume divided by a movable membrane into first and second compartments each having an inlet and an outlet, comprising:

(a) two valve pairs, each pair having an on/off valve associated with an inlet and an outlet on opposite sides of the membrane, whereby discrete predetermined volumes of fluid will be delivered upon alternate openings of each valve pair so that one of the compartments fills and moves the membrane across the chamber to empty the other compartment;

(b) means for moving all valves to the off position at the same time after filling of one of the compartments;

(c) means for thereafter initially moving one valve to the on position, while maintaining the other valves in the off position.

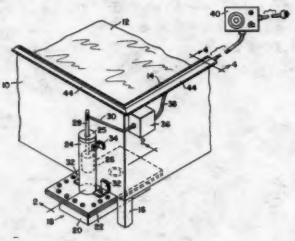
(d) means for detecting if the membrane has moved upon the occurrence of step (c) indicating that a supposedly closed valve is leaking fluid.

4,602,250

TANK LEAKAGE DETECTION SYSTEM

Edward R. Peace, 41452 Thornton Ave., Hemet, Calif. 92343

Filed Feb. 11, 1985, Ser. No. 700,136
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—605 7 Claims



1. A leak detection system for a corrosive liquid containing tank having outer steel walls and a non-corroding liner comprising:

a small closed reservoir located at least in part below the bottom of the tank and attached thereto, said reservoir being in fluid communication with the space between the outer steel walls of the tank and the non-corroding liner of the tank, said reservoir further including an extension rising upwardly from the main body of the small reservoir and adjacent to a side of the tank, and

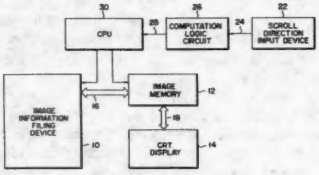
float means within the reservoir extension and mechanically connected to a switch which actuates an alarm means upon entry of the corrosive liquid into the reservoir, the rising liquid causing upward movement of the float means, thereby tripping the switch, the float being free to travel within the extension upwardly from a first level at least slightly below the bottom of the tank liner, said first level representing a no alarm condition.

4,602,251

IMAGE DISPLAY SYSTEM FOR CONTROLLING THE SCROLL OF A PARTIAL IMAGE ON A DISPLAY SCREEN

Nobuo Sawada, Atsugi; Masatsugu Kidode, and Hidenori Shinoda, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 24, 1983, Ser. No. 526,158
Claims priority, application Japan, Aug. 30, 1982, 57-150254
Int. Cl.[4] G09G *1/06*
U.S. Cl. 340—724 8 Claims



1. An image display system comprising:

(a) first memory means for storing the entire area of an original image representing a photographed real image in such a manner that image data of each of a plurality of unit image components uniformly divided from the original image is scanned along two different scanning directions to produce first and second image data trains with respect to each of the unit image components;

(b) display means having a limited display screen on which the original image is partially displayed;

(c) second memory means connected to said first memory means and directly connected to said display means so as to permit direct reception of image data read out from said first memory means, said second memory means temporarily storing certain image data containing display image data representing a partial image of the original image to be actually displayed on the display screen, and surrounding image data representing a surrounding image having a predetermined surrounding area around the partial image;

(d) scroll direction input means operated manually by an operator, for producing an electrical command signal to specify a desired scroll direction along which a display area on the display screen is shifted throughout the entire area of the original image; and

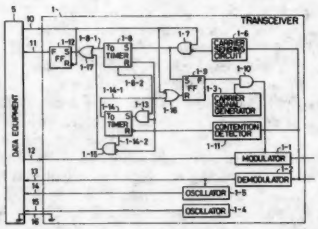
(e) control means, connected to said scroll direction input means and said first and second memory means, for, when the display screen is scrolled in a designated direction, electrically updating the memory content of said second memory means by substituting new image data, which is read out from said first memory means and represents a lacking image component due to the scroll of the display area, of old image data, which will be surplus due to the scroll of said display area, said control means selecting, from the first and second image data trains, one image data train which at least partially includes said lacking image component due to the scroll and which has such a desired scanning direction as to reduce the readout operation time of said second memory means.

4,602,252

METHOD AND DEVICE FOR DATA COMMUNICATION

Yukio Nakata, Kawasaki, and Kaoru Suda, Ohmiya, both of Japan, assignors to Hitachi, Ltd. and Yagi Antenna Co., Ltd., both of Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,030
Claims priority, application Japan, Jan. 8, 1982, 57-950
Int. Cl.[4] H04Q *9/00;* H04N *15/00*
U.S. Cl. 340—825.5 6 Claims



1. A method for data communication for use in a system having a common transmission line, a plurality of data processing equipment, and a respective transceiver connecting each of said plurality of data processing equipment to said common transmission line and adapted to send data from the corresponding data processing equipment to said common transmission line as data modulated on a carrier signal, as well as to send the data as modulated on a carrier signal from said common transmission line to said corresponding data processing equipment after demodulation, the method comprising:

(1) a first step of sending a request signal, indicating a request to send data, from one data processing equipment to its associated transceiver;

(2) a second step of sending from said associated transceiver a carrier signal having no data modulated thereon to said common transmission line in response to said request signal from said first data processing equipment if no

carrier signal is detected on said common transmission line; and

(3) a third step of applying to said one data processing equipment from its associated transceiver a signal granting permission to send data when a carrier signal from any of the other transceivers is not detected on said common transmission line by said associated transceiver during a given period of time after the start of sending of said carrier signal therefrom.

4,602,253

APPARATUS FOR MUTUAL INFORMATION TRANSMISSION IN A LOCK AND KEY SYSTEM

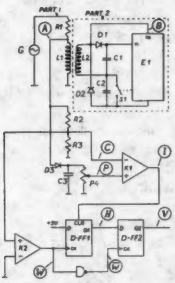
Hans-Dietrich Kreft, Reinbeck, Fed. Rep. of Germany, assignor to Angewandte Digital Elektronik GmbH, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,347

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402737

Int. Cl.[4] G06F *7/04*

U.S. Cl. 340—825.31 **6 Claims**



1. An electronic lock control device for use in lock-key system having a lock and a key for inductive coupling with said lock and thereby generating an encoded signal of damped and undamped signals, comprising:

means in said lock for generating a periodic signal;

coil means in said lock for transmitting said periodic signal;

said coil means being selectively energetically coupled to said key to alternately damp and undamp said periodic signal

means in said lock for comparing the amplitudes of said damped and undamped periodic signal comprising:

a first comparator means;

means for supplying one side of said comparator means with a first signal having an amplitude between the amplitude of said damped periodic signal and the amplitude of said undamped periodic signal;

means for supplying a second side of said comparator means with said damped and undamped periodic signal;

said comparator producing a periodic comparator signal during said undamped periodic signal and producing a continuous signal during said damped periodic signal; and

means for removing said periodic comparator signal and retaining said continuous signal;

whereby a signal is produced only during said damped periodic signal.

4,602,254

PAGING RECEIVER WHICH IS RESETTABLE WITH EXTERNAL-NOISE DETECTOR

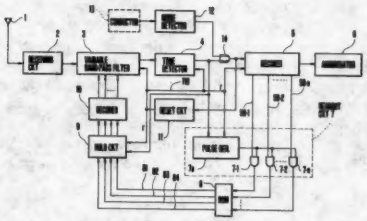
Kazumori Yamada, and Masaaki Akahori, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 582,175

Claims priority, application Japan, Feb. 25, 1983, 58-29284

Int. Cl.[4] G08B *5/22*

U.S. Cl. 340—825.48 **14 Claims**



1. A paging receiver for responding to a receipt of encoded tone radio signals, said receiver comprising:

memory means for storing codes corresponding to an identification number of said paging receiver;

readout means for reading out any one of the codes from said memory means;

holding means responsive to said readout means for temporarily storing the code read out from said memory means;

selecting and detecting means for selectively detecting a received one of said encoded tone signals when the code of the tone signal coincides with the code stored in said holding means;

external noise detecting means for detecting an external noise component which alters the holding state of said holding means; and

resetting means for resetting said readout means, said holding means and said selecting and detecting means in response to an output from said external noise detecting means.

4,602,255

LUGGAGE DOOR UNLOCKING DEVICE FOR VEHICLE

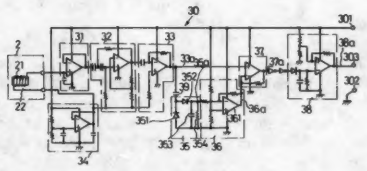
Junji Kitagawa; Shigeyuki Akita, and Kouichi Yamanoue, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 24, 1984, Ser. No. 603,334

Claims priority, application Japan, Apr. 25, 1983, 58-73550

Int. Cl.[4] G08C *19/00*

U.S. Cl. 340—825.69 **7 Claims**



1. A luggage door unlocking device comprising:

a portable signal transmitter capable of transmitting a magnetic unlocking signal comprised of a high-frequency pulse train having a predetermined code;

a magnetic sensor mounted on a vehicle and capable of generating a reception signal upon the reception of the unlocking signal when the signal transmitter is brought near the magnetic sensor;

signal processing means to detect the reception signal and to provide a detection signal;

signal discriminating means to provide an unlocking command signal only when the detection signal corresponds to the predetermined code; and

driving means to actuate an unlocking mechanism upon the reception of the unlocking command signal;

said signal processing means including:

a smoothing circuit which smoothes the reception signal and provides a smoothed signal;

an inverting circuit which inverts the signal level of the smoothed signal to provide an inverted signal;

a comparator which receives the reception signal and the inverted signal and lets the reception signal pass only when the signal level of the reception signal changes beyond the signal level of the inverted signal; and

a detection circuit which detects the reception signal which has passed the comparator to provide a detection signal of a pulse train corresponding to the reception signal.

4,602,256

LUGGAGE DOOR UNLOCKING DEVICE FOR A VEHICLE

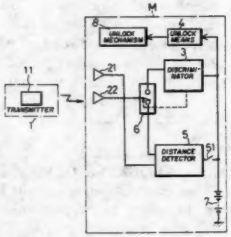
Yoshiyuki Kago, Nukata, and Shigeyuki Akita, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 13, 1984, Ser. No. 579,503

Claims priority, application Japan, Feb. 14, 1983, 58-21418; Mar. 2, 1983, 58-35002

Int. Cl.[4] G08C *19/00*

U.S. Cl. 340—825.72 **11 Claims**



1. A luggage door unlocking device for a vehicle, comprising:

(1) a portable transmitter which comprises a case and a transmitting means for generating an unlocking signal having an ultrasonic frequency, said transmitting means being supported by said case;

(2) a receiving means mounted on the vehicle and comprising an ultrasonic wave receiver for receiving an ultrasonic signal from the outside of the vehicle, a discriminating means for discriminating the signal received by said receiver to obtain said unlocking signal, a signal processing means for transmitting an ultransonic signal out of the vehicle and processing the signal received by said receiver, and a switching means for connecting said ultrasonic wave receiver to said discriminating means when said vehicle is not operating and for connecting said ultrasonic wave receiver to said signal processing means when the vehicle is operating; and

(3) an unlocking means mounted on the vehicle for operating a luggage door unlocking mechanism of the vehicle upon receipt of said unlocking signal after discrimination by said discriminating means.

4,602,257

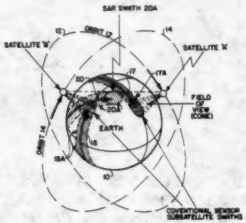
METHOD OF SATELLITE OPERATION USING SYNTHETIC APERTURE RADAR ADDITION HOLOGRAPHY FOR IMAGING

William H. Grisham, 430 Russell Ave., Long Beach, Miss. 39560

Filed Jun. 15, 1984, Ser. No. 620,911

Int. Cl.[4] G01S *13/89*

U.S. Cl. 343—5 CM **13 Claims**



1. A method for satellite based synthetic aperture radar imaging from at least two satellites, one of which is equipped with a synthetic aperture radar transmitter and another of which is equipped with a synthetic aperture radar receiver comprising:

establishing the satellites in nominally circular and orthogonal orbits, wherein the satellites orbit at equal angular velocity with respect to the earth, and wherein the polar crossing of the first satellite is coincidental with the equatorial crossing of the second satellite, the first and the second satellites thereafter traversing equal angle displacement with respect to the polar and equatorial axes respectively;

establishing an inter-satellite communications link for communicating data between the satellites, said data communication including coherent oscillator synchronization signals of the radar and of the communication system, and inter-satellite range and range rate data;

maintaining the physical center line of the transmission and reception radar antennae and communication antennae on the satellites tracking dynamically in a constant angular momentum mode;

illuminating an area of the earth with synthetic aperture radar transmission from one of the satellites;

receiving the reflected radar signal at the other of said satellites; and

recording the received synthetic aperture radar in an isometric plane, said isometric plane being parallel to the plane perpendicular to one of the eight isometric vectors, said isometric vectors having an origin at the center of the earth and being equiangular with respect to the polar and equatorial axes of the earth in one of the eight quadrants defined by the polar and equatorial axes of the earth.

4,602,258

PROCESS FOR REMOVING DISTANCE MEASUREMENT AMBIGUITY AND A RADAR USING THIS PROCESS

Pierre Sarfati, Paris, France, assignor to Thomson CSF, Paris, France

Filed Sep. 24, 1982, Ser. No. 423,314

Claims priority, application France, Mar. 12, 1982, 82 04223

Int. Cl.[4] G01S *13/46, 7/28*

U.S. Cl. 343—13 R **14 Claims**

1. A method of removing ambiguity in measurements of distance from a radar to a target, where the target is in the detection space of said radar for a given period of time, comprising the steps of:

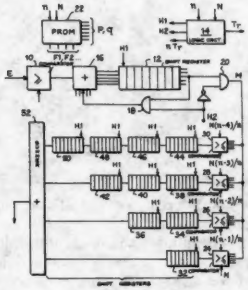
emitting a plurality of bursts toward said target, each burst including n pulses with a recurrence period Tr between

successive pulses, each pulse having an emission frequency which is common to all pulses in a burst, a total of N pulses being emitted while said target is in said detection space;

changing the emission frequency of said pulses from burst to burst;

receiving pulses reflected from said target, the pulses from each burst being identifiable by their emission frequencies;

counting a total number of received pulses M;



comparing said number M with a predetermined succession of numbers N(n-i)/n, where i is a predetermined successive series of integers; and

determining two successive numbers N(n-i+1)/n and N(n-i)/n from said predetermined succession of numbers which said number M falls between, whereby the unambiguous distance to the target is between (i−1)cTr/2 and icTr/2, where c is the speed of electromagnetic propagation.

4,602,259

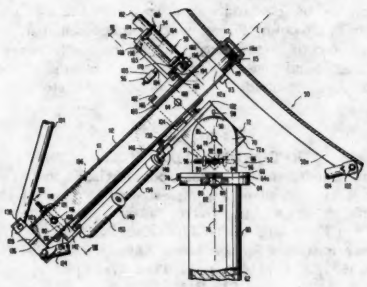
POLAR MOUNT ANTENNA SATELLITE TRACKING APPARATUS AND METHOD OF ALIGNMENT THEREOF

John O. Shepard, P.O. Box 166, Saxtons River, Vt. 05154

Filed Jul. 12, 1982, Ser. No. 397,306

Int. Cl.[4] H01Q *3/00*

U.S. Cl. 343—359 **10 Claims**



1. A method for closely aligning a TVRO antenna or the like with an earth equatorial satellite track sector bearing a plurality of satellites within said sector to permit rapid selective alignment of the antenna boresight with a given one of said satellites, said method comprising:

mounting said antenna at a site location on the earth's surface with the antenna boresight generally directed toward said sector,

rotating said antenna about a first, polar axis parallel to the earth's polar axis to provide longitude orientation of said antenna,

rotating said antenna about a second axis at right angles to the first rotation axis to orient the antenna in elevation corresponding to the earth's latitude position for the antenna, and wherein rotation of the antenna about said first axis creates a boresight cone which overlaps the satellite track, and

tilting the axis of the boresight cone out of parallel to the earth's polar axis in the plane of longitude through the antenna site to generate an ellipse whose long axis or short axis, at both ends, lies tangent to the satellite track to maximize boresight alignment of the antenna with a given satellite within said satellite track sector, and

wherein the boresight of said antenna is at right angles to the polar axis of rotation of said antenna:

the center of the earth comprises the point 0;

the site of the satellite on the earth's surface is S;

points A and A′ are diametrically opposite intersection points on the satellite track of a plane passing through the earth's longitude at site S;

Λ is the angle between the earth's equatorial plane and the antenna site S;

the antenna is provided with a declination or dip angle in the longitude plane and away from the earth's polar axis equal to half the sum of the angles SAO and SA′O, and;

the angle of tilt of said boresight cone out of parallel to the earth's polar axis equals half the difference between the angles SAO and SA′O;

with the relationshiop;

where AO=A′O=the radius of satellite orbit=26,279 miles and

SO=the radius of the earth taken as 4,000 miles, such that;

$$\text{angle } SAO = \tan^{-1}\frac{4{,}000 \text{ sine } \Lambda}{26{,}279 - 4{,}000 \text{ cosine } \Lambda}$$

and

$$\text{angle } SA'O = \tan^{-1}\frac{4{,}000 \text{ sine } \Lambda}{26{,}279 + 4{,}000 \text{ cosine } \Lambda}$$

4,602,260

WINDSHIELD ANTENNA

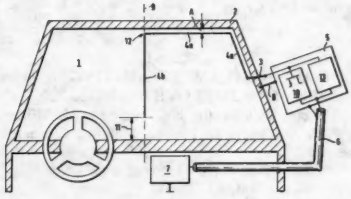
Heinz Lindenmeier, Planegg; Gerhard Flachenecker, Ottobrunn, and Jochen Hopf, Haar, all of Fed. Rep. of Germany, assignors to Hans Kolbe & Co., Bad Salzdetfurth, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,312

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315458

Int. Cl.[4] H01Q *1/32*

U.S. Cl. 343—701 **15 Claims**



1. An active windshield antenna for a power vehicle for ultra short wave and long medium short wave radio reception, comprising a metallic frame associated with the windshield pane of a power vehicle and having a substantially vertical line of symmetry and dividing the windshield into two similar sections; an antenna wire having two ends, said antenna wire

being confined to one only of said similar sections; and an antenna amplifier having two input terminals being arranged adjacent to said metallic frame, said input terminals including a first input terminal connected with one of said ends of said antenna wire and a second input terminal connected with said metallic frame and an outlet conduit leading from said amplifier to a receiver, said antenna wire including a first conductor which extends parallel to said frame up to said substantially vertical line of symmetry and a second conductor extending from said first conductor in a bending point and along said line of symmetry, said amplifier being formed so that for the low frequency low medium short wave region and the ultra short wave region separate transmission paths are obtained, whereas the transmission path of the low medium short wave region at its input has a high input impedance and the input impedance of said amplifier in the low medium short frequency region is high-impedance.

4,602,261

INK JET ELECTRODE CONFIGURATION

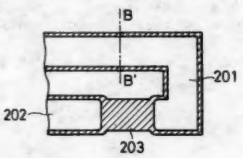
Hiroto Matsuda, Ebina; Makoto Shibata, Hiratsuka; Masami Ikeda, Machida, and Hiroto Takahashi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 597,935

Claims priority, application Japan, Apr. 19, 1983, 58-67722

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **14 Claims**



1. A liquid jet recording head comprising:

a liquid discharging portion having an orifice for discharging liquid as flying liquid droplets and a liquid flow area communicating with said orifice; and

an electro-thermal converting element including a heat-generating resistive layer electrically connected to an electrode to form in said liquid flow area heat generating means having a predetermined width for generating energy in liquid in said liquid flow area for discharging the flying liquid droplets, said electrode including an electrode layer overlying said heat generating resistive layer and having a terminal end at said heat-generating means, wherein the width of said heat-generating resistive layer immediately underlying said electrode layer at said terminal end thereof is greater than said predetermined width and greater than the width of said electrode layer at said terminal end thereof.

4,602,262

PRINTING APPARATUS WITH SHIFTING OF HEAD OR DRUM TO IMPROVE RESOLUTION

Ray K. Milligan, Indiatlantic, Fla., and Sean H. Milligan, Raleigh, N.C., assignors to Helene Holding Company, Melbourne, Fla.

Filed Oct. 13, 1983, Ser. No. 541,680

Int. Cl.[4] G01D *15/14*

U.S. Cl. 346—160 **21 Claims**

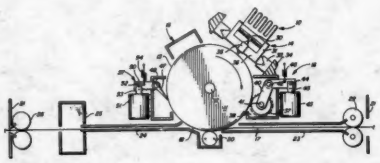
1. An apparatus for producing dots which forms images on a surface comprising in combination:

a dot forming array for selectively generating a plurality of groups of said dots to form each image;

a transfer drum rotatably mounted to receive said dots on the surface thereof from said dot forming array, said transfer drum being adapted to place said dots onto another surface;

charging means for charging said drum during at least one rotation of said drum of a plurality of rotations of said drum and to be disabled during at least one of said plurality of rotation of said drum;

means to shift the relative position of said dot forming array relative to said transfer drum to permit one group of said groups of dots to be generated during one of said rotations and a difference groups of said groups of dots to be gener-



ated during a different rotation of said plurality of rotations of said drum; and

developer means shiftably mounted for developing an image on said transfer drum in one position and having a second position disabling said developer means from developing the image on said transfer drum; and

means to shift said developer means between said one position and said second position during selected of said rotations of said drum, whereby said drum may have said dots placed thereon during said plurality of rotations of the drum.

4,602,263

THERMAL IMAGING METHOD

Alan L. Borror, Lexington; Ernest W. Ellis, Carlisle, and Donald A. McGowan, Stoneham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 4, 1984, Ser. No. 646,771

Int. Cl.[4] B41M *5/26*

U.S. Cl. 346—201 **21 Claims**

1. A method of thermal imaging which comprises heating imagewise a heat-sensitive element comprising a support carrying at least one layer of an organic compound capable of undergoing an irreversible unimolecular fragmentation of at least one thermally unstable carbamate moiety, said organic compound initially absorbing radiation in the visible or the non-visible region of the electromagnetic spectrum and said imagewise heating effecting said irreversible unimolecular fragmentation of said carbamate moiety whereby the absorption of said organic compound is visibly changed in said layer in an imagewise pattern corresponding to said imagewise heating.

4,602,264

RECORDING MATERIALS

Shunshuke Shioi; Gensuke Matoba, both of Osaka, and Makoto Miyake, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1983, Ser. No. 522,315

Claims priority, application Japan, Aug. 25, 1982, 57-148428; Aug. 28, 1982, 57-149414; Sep. 25, 1982, 57-167012

Int. Cl.[4] B41M *3/14*

U.S. Cl. 346—205 **11 Claims**

1. In a recording material producing images due to a complex formed from an organic phosphorus-iron compound having a bond of at least one of PO^- with Fe^{3+} and PS^- with Fe^{3+} in the molecule and a ligand compound which reacts with the organic phosphorus-iron compound, the improvement wherein at least one of

(a) a colorless or light-colored oil-soluble or heat-fusible organic compound adheres to the surface of the organic phosphorus-iron compound and

(b) an organic base is present out of contact with the organic phosphorus-iron compound.

4,602,265

NON-AQUEOUS COMPOSITIONS FOR HEAT-SENSITIVE MULTI-LAYER COATINGS

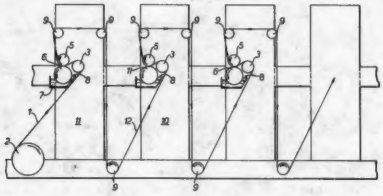
Arthur K. Philpott, Neerim South, and Gordon H. Poole, Mitcham, both of Australia, assignors to Mark Sensing (Aust.) Pty. Limited, Australia

Filed Apr. 11, 1984, Ser. No. 599,000

Claims priority, application Australia, Apr. 11, 1983, PF8810/83

Int. Cl.[4] B05D *1/36, 7/00;* **B41M** *3/12, 5/00*

U.S. Cl. 346—210 **8 Claims**



1. A substrate coated with a heat sensitive color-producing multilayer coating comprising:

(a) a base coating layer formed from a non-aqueous, quick drying base polymeric coating composition consisting essentially of:

(i) an alcohol solution of an organic film-forming polymer,

(ii) a source of polyvalent metallic ions, having a standard reduction potential greater than one-tenth of a volt,

(iii) at least one fatty acid or non-metallic derivative thereof, and

(iv) an alcohol,

(b) a second coating layer, on the base coating layer, formed from a non-aqueous, quick drying sensitizing coating composition consisting essentially of:

(i) an alcohol solution of organic film-forming polymer,

(ii) at least one fatty acid or non-metallic derivative thereof, and

(iii) at least one reducing agent selected from the group consisting of catechol, pyrogallol, hydroquinone, diphenyl carbazides, gallic acid esters and derivatives thereof; and

(c) a third coating layer, on the second coating layer, formed from the base polymeric coating composition as set forth in step (a).

4,602,266

HIGH VOLTAGE GUARD RING WITH VARIABLE WIDTH SHALLOW PORTION

David J. Coe, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

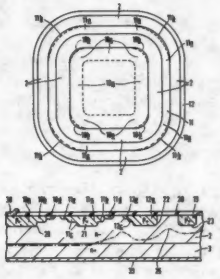
Filed Jan. 13, 1984, Ser. No. 570,565

Claims priority, application United Kingdom, Jan. 28, 1983, 8302443

Int. Cl.[4] H01L *29/06*

U.S. Cl. 357—20 **11 Claims**

1. A semiconductor device comprising a semiconductor body having a portion of one conductivity type adjoining a major surface of the body, an active device region of the opposite conductivity type also adjoining said major surface and forming with said portion a main p-n junction which extends to said major surface and which is operated under reverse bias in at least one mode of operation of the device, and at least one annular region of said opposite conductivity type extending around said active device region, which at least one annular region adjoins said major surface and forms with said portion an auxiliary p-n junction located within the spread of a depletion layer from the reverse-biased main p-n junction so as to increase the breakdown voltage of the main p-n junction, said active device region and said annular region being more highly doped than said portion of the body, characterized in that, of the group formed by the active device region and the annular regions, at least a first region comprises both a deep portion



and a shallower portion which extends laterally outwards from the deep portion toward a surrounding annular region of the group, said first region having an outer perimeter in the form of straight sides joined by rounded corners, and the shallower portion being located at the rounded corners but not along the whole length of the straight sides.

4,602,267

PROTECTION ELEMENT FOR SEMICONDUCTOR DEVICE

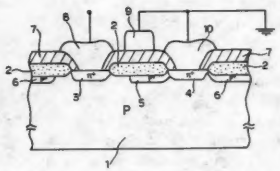
Takehide Shirato, Hiratsuka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 5, 1982, Ser. No. 346,224

Claims priority, application Japan, Feb. 17, 1981, 56-22008; Aug. 31, 1981, 56-136663

Int. Cl.[4] H01L *29/72, 29/90, 27/04*

U.S. Cl. 357—35 **5 Claims**



1. A protection element responsible for protecting a semiconductor element included in a semiconductor device having a semiconductor substrate, said protection element preventing the semiconductor element from receiving voltages higher than a maximum allowed voltage, said protection element comprising:

power supply means for providing a power supply voltage;

a first region having a first conductivity type;

an insulating layer substantially covering said first region;

a second region having a second conductivity type different from that of said first region, said second region being formed in a first selected top portion of said first region;

a third region having the second conductivity type, said third region being formed in a second selected top portion of said first region;

a fourth region disposed between said second region and said third region, said fourth region being covered by said insulating layer, said fourth region being of the first conductivity type at a higher impurity concentration than that

of said first region, said fourth region being separated from said second region, and said fourth region preventing punch-through between said second and third regions;

a first electrode connected to the semiconductor element and to said second region; and

a second electrode in contact with said third region, connected to receive the power supply voltage from said power supply means, the power supply voltage being such that a current flows between said second and third regions by a bipolar transistor action with the first region acting as a base when the voltage higher than the maximum allowed voltage are applied to said first electrode, thereby preventing the semiconductor element from receiving the voltages higher than the maximum allowed voltage.

4,602,268

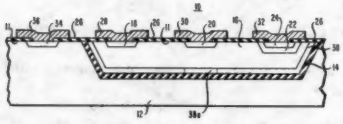
HIGH VOLTAGE DIELECTRICALLY ISOLATED DUAL GATE SOLID-STATE SWITCH

Adrian R. Hartman, New Providence; Alfred U. MacRae, Berkeley Heights, both of N.J., and Peter W. Shackle, West Melbourne, Fla., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 248,305, Mar. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 107,772, Dec. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 972,021, Dec. 28, 1978, abandoned. This application Dec. 23, 1981, Ser. No. 333,762

Int. Cl.⁴ H01L *29/74*

U.S. Cl. 357—38 **6 Claims**



1. A switching element comprising a semiconductor body having a bulk region of one conductivity type and of relatively high resistivity; the body also having anode, gate, and cathode regions spaced apart and localized along a common top planar surface of the body, each being of relatively low resistivity, the cathode and gate regions being of the opposite conductivity type from that of the bulk region and the anode region being of the same conductivity type as that of the bulk region; separate cathode, anode, and gate electrodes attached to the cathode, anode, and gate regions, respectively; the a semiconductor support member separated from the semiconductor body by a dielectric layer; a semiconductor layer of the same conductivity type as the cathode region, the semiconductor layer being electrically coupled to the gate region and being sandwiched between the dielectric layer and the semiconductor body; the parameters of the switching element being such that with the potential of the anode region being greater than that of the cathode region and the potential of the gate region being insufficient to essentially completely deplete a cross-sectional portion of the bulk region of the semiconductor body between the anode and cathode regions, a substantial current flows between the anode and cathode regions via the bulk region, and with the anode region being forward-biased with respect to the cathode region and with the potential of the gate region being of sufficiently greater magnitude than that of the anode region so as to essentially completely deplete a cross-sectional portion of the bulk region of the semiconductor body located between the anode and cathode regions and to cause this portion of the bulk region of the semiconductor body to be at a potential which is greater in magnitude than the anode region, an interrupting of the current between the anode and cathode regions occurs.

4,602,269

HIGH SPEED DRIVING CIRCUIT

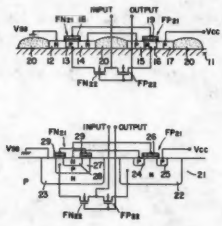
Hideharu Koike, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 10, 1983, Ser. No. 550,612

Claims priority, application Japan, Nov. 10, 1982, 57-197372

Int. Cl.⁴ H01L *27/02;* **H03K** *19/20, 19/02, 17/687*

U.S. Cl. 357—42 **3 Claims**



1. A semiconductor circuit comprising:

(a) a complementary field effect transistor circuit, wherein a first gate and a first drain of a first field effect transistor of a first conductivity type are connected to a second gate and a second drain of a second field effect transistor of a second conductivity type, respectively, said first and second gates serving as an input terminal, and said first and second drains serving as an output terminal, and a source of each field effect transistor being connected to first and second reference power sources, and

(b) an additional complementary field effect transistor circuit, wherein a third gate and a third drain of a third field effect transistor of the first conductivity type are connected to a fourth gate and a fourth drain of a fourth field effect transistor of the second conductivity type, said third and fourth drains being connected to said input terminal, and said third and fourth gates being connected to said output terminal, and a source of each of said third and fourth field effect transistors being connected to a substrate of a transistor of said complementary field effect transistor circuit.

4,602,270

GATE ARRAY WITH REDUCED ISOLATION

Leonard S. Finegold, and Christopher A. Freymuth, both of Colorado Springs, Colo., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 17, 1985, Ser. No. 735,405

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—42 **3 Claims**

1. An integrated circuit gate array comprising a semiconductor substrate, a set of active-area columns of active areas formed within said substrate comprising P and N-Channel active regions between conductive means for supplying power supply voltages at ground and at a predetermined voltage, the members of said set of active-area columns being separated by a set of inter-column routing channels extending along and between neighboring columns, a set of gate pairs positioned above said P and N-Channel regions of said active-area columns, the gates of said gate pairs being adapted to form with said active areas a plurality of field effect transistors; and

means for interconnecting said plurality of field effect transistors to form an integrated circuit comprising a predetermined set of subcircuits separated from one another by selected subcircuit isolation means, which means for interconnecting comprises:

a predetermined set of electrical substrate contacts extending, from selected contact positions within a set of permitted contact positions in said substrate, away from said substrate;

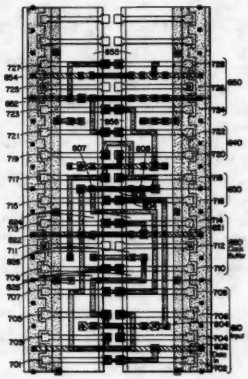
a set of first-level interconnections formed from conductive

material and being routed in predetermined routing paths to make electrical contact with at least some of said predetermined set of electrical substrate contacts, whereby electrical connections to said substrate are made by at least some of said first-level interconnections;

a set of second-level interconnections disposed in predetermined routing paths for interconnecting selected components of said integrated circuit; and

a set of vias for connecting selected points on selected ones of said second-level interconnections to selected points in a level below said second-level interconnections, said vias being located at selected via positions within a set of permitted via locations, in which integrated circuit;

at least one pair of first and second neighboring subcircuits extending along one of said set of active-area columns are separated by subcircuit isolation means comprising a predetermined pair of isolation regions of one of said active-area columns, said pair of isolation regions being formed by connecting said predetermined isolation regions to respective power supply means, thereby rendering said isolation region insensitive to electrical signals at neighboring points in said active area, whereby that gate of said first neighboring subcircuit closest to each of said predetermined isolation regions is the gate of a transistor having one terminal at the fixed potential of said power supply means and those corresponding gates of said second neighboring subcircuit closest to said predetermined isolation regions are also a component of a transistor having one terminal at the fixed potential of said power supply means, both of said terminals of said closest transistors being formed in said predetermined isolation region, whereby said gates closest to said isolation region have no inactive blocking gates between them.



4,602,271

PERSONALIZABLE MASTERSLICE SUBSTRATE FOR SEMICONDUCTOR CHIPS

William E. Dougherty, Jr., Poughkeepsie, N.Y.; Stuart E. Greer, Shelburne; William J. Nestork, Charlotte, both of Vt., and William T. Norris, Georgetown, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 285,725, Jul. 22, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 682,963

Int. Cl.[4] **H01L** *39/04, 23/02, 23/08*

U.S. Cl. 357—80 **3 Claims**

1. A personalizable masterslice substrate for semiconductor chips comprising:

an insulating block of material having a chip mounting surface and a reverse surface opposite said chip mounting surface;

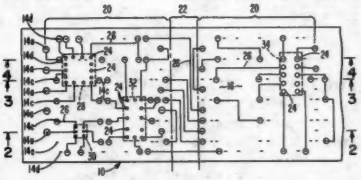
said block of material being formed of a plurality of rectangular planar faced dielectric laminae bonded together at said planar faces thereof;

said plurality of rectangular planar faced dielectric laminae having edge surfaces, a first edge surface being said chip mounting surface, an opposite edge surface being said reverse surface;

a plurality of conductors formed in longitudinally repeating conductor patterns on selected ones of said plurality of rectangular planar faced dielectric laminae, adjacent ones of said selected ones of said plurality of rectangular planar faced dielectric laminae having different conductor patterns;

at least some of said plurality of conductors terminating at a first portion of said chip mounting surface and forming a first surface pattern of conductor ends thereon;

at least some others of said plurality of conductors terminating at a first portion of said chip mounting surface and forming a second surface pattern of conductor ends thereon;



the first and second surface patterns of conductor ends being identical and spaced from each other by a third portion of said chip mounting surface containing no conductor ends;

a first plurality of chip site determining metal pads formed only on selected ones of said plurality of conductor leads terminating at the first portion of said chip mounting surface, forming a first pattern of metal pads;

at least a second plurality of chip site determining metal pads formed only on selected ones of said conductor leads terminating at the second portion of said chip mounting surface, forming a second pattern of metal pads;

the first and second patterns of metal pads being different, thereby providing a plurality of chip mounting sites differing in size, location and connection patterns, said chip mounting sites being personalizable by the forming of metal pads on only selected ones of said plurality of conductor leads terminating at the edge surface being said chip mounting surface.

4,602,272

ELECTRON BEAM INTENSITY PROFILE MEASURING SYSTEM AND METHOD

Robert A. Duschl, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 13, 1984, Ser. No. 670,605

Int. Cl.[4] **H04N** *17/02*

U.S. Cl. 358—10 **5 Claims**

3. A method of measuring the intensity profile of the electron beams in a CRT having a screen composed of triads of phosphors for producing different color of light when impacted by said electron beams comprising the steps of:

imaging one color field from said scan onto a camera having a charge coupled device (CCD) whereby the pixels of said CCD are charged to levels representative of the electron beam intensity;

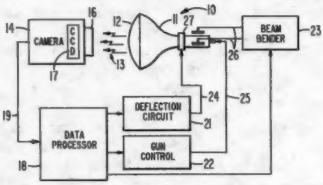
identifying the edges of one of said triads and selecting a CCD pixel in the proximity of the center of said triad;

turning off said color field;

positioning the electron beam for producing said color field in the proximity of said selected pixel;

scanning said electron beam in a scan direction while incrementally stepping said beam across said pixel in a stepping direction substantially normal to said scan direction;

recording the beam intensity related charge level on said



CCD whereby the intensity profile of said beam in said stepping direction is measured; and

interchanging said scan direction and said stepping direction whereby the beam intensity profile in said scan direction is measured

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4,602,273

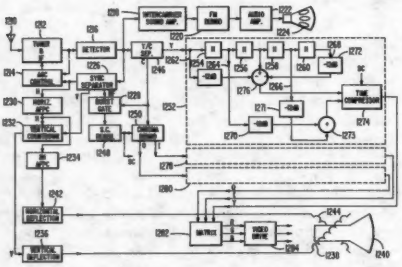
INTERPOLATED PROGRESSIVE-SCAN TELEVISION DISPLAY WITH LINE-CRAWL ARTIFACT FILTRATION

Curtis R. Carlson, Princeton Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 30, 1983, Ser. No. 527,769

Int. Cl.[4] H04N *7/01, 11/22*

U.S. Cl. 358—11 **27 Claims**



1. An interpolator for generating scan lines for progressive display from a television signal representing an image scanned by a raster consisting of scan lines separated by a distance 2S, time-alternately interlaced with a second raster of scan lines also separated by 2S, comprising:

means for sampling the signal with a plurality of taps separated in spatial frequency by S;

multiplying means coupled to each of said taps for, at each tap multiplying the signal intercepted by said tap by a constant, which constant may be zero;

summing means coupled to said multiplying means having a non-zero value for summing the outputs thereof in such a manner as to form a pair of filtered video output signals for display alternately in progressive scan fashion, said summing means summing said outputs of said multiplying means so as to attenuate to zero those signal components of each output at a vertical spatial frequency of $\pm\frac{1}{4}S$ and so as to amplify to an amplitude greater than the zero-spatial-frequency signal component at least some of the signal components lying between the vertical spatial frequency of zero and $\pm\frac{1}{4}S$ while maintaining the same image phase in the region of vertical spatial frequencies between zero and $\pm 1/S$.

4,602,274

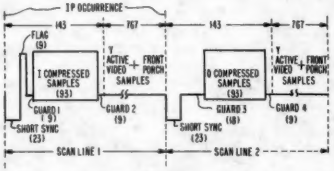
IYQY FORMAT TELEVISION SIGNAL ENCODING AND DECODING APPARATUS

Alfonse Acampora, Staten Island, N.Y., and Robert J. Petri, Montgomery Township, Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 27, 1983, Ser. No. 565,286

Int. Cl.[4] H04N *9/42, 9/32*

U.S. Cl. 358—11 **22 Claims**



1. Encoding apparatus for transforming a television signal originally in composite NTSC format into a predetermined serial IYQY time-multiplexed format television signal, wherein said composite NTSC format is comprised of successive horizontal scan-line periods each consisting of a "sync+back porch" portion followed by a "Y and C active video+front porch" portion, said "sync+back porch" portion being comprised of a standard length horizontal sync pulse extending below a given blanking level followed by a back porch at said given blanking level on which a color burst at frequency f_{cc} is superimposed, the leading edge of said standard sync pulse defining the beginning of each successive horizontal scan-line period, and said front porch of said "Y and C active video+-front porch" portion being at said given blanking level; said encoding apparatus comprising:

first means responsive to the leading edge of each of said NTSC successive standard-length horizontal sync pulses (1) for dividing each of successive horizontal scan-line periods into 910 sequential sample periods, each sample period being $\frac{1}{4}$ the period of f_{cc}, and (2) for designating alternate ones of successive horizontal scan-line periods as IY horizontal-scan-line periods and the remaining ones of successive horizontal scan-line periods as QY horizontal-scan-line periods;

second means for filtering said NTSC format television signal during each of said successive horizontal scan-line periods into separate C and Y components; and

third means coupled to said first and second means for deriving as said predetermined serial IYQY time-multiplexed format a serial IY time-multiplexed television signal component having a first predetermined format during each horizontal scan-line period designated as an IY horizontal scan-line period and for deriving a serial QY time-multiplexed television signal component having a second predetermined format during each horizontal scan-line period designated as a QY horizontal scan-line period;

wherein both said first and second predetermined formats of said IY and QY components include (1) a short sync pulse comprised of the leading edge and a fractional part of said standard-length NTSC sync signal, said short sync pulse having a length equal to a first given integral number of sequential sample periods, and (2) Y active video and front porch samples situated within the time interval occupied by the "Y and C active video+front porch" portion of the NTSC horizontal scan-line period, said Y active video and front porch samples being comprised of a second given integral number of sequential sample periods;

wherein said first predetermined format of an IY component further includes a flag pulse immediately following said short sync, a first guard immediately following said flag pulse, a set of time-compressed I samples immediately following said first guard, and a second guard immedi-

ately following said set of time-compressed I samples and immediately preceding any Y active video and front porch samples of that IY component horizontal scan-line period, said flag pulse having a given level above said given blanking level and having a length equal to a third given number of sequential sample periods, said first and second guards having a level substantially equal to said given blanking level and having lengths equal respectively to fourth and fifth given integral numbers of sequential sample periods, and said set of time-compressed I samples having respective levels above said given blanking level and being comprised of a sixth given integral number of samples occupying sequential sample periods, with the respective levels of said set of time-compressed I samples corresponding to a first set comprised of successive levels of C that occur during each of every 2nth (where n is a given integer) sample period of the active video portion of an IY component horizontal scan-line period; and

wherein said second predetermined format of an QY component includes a third guard immediately following said short sync, a set of time-compressed Q samples immediately following said third guard, and a fourth guard immediately following said set of time-compressed Q samples and immediately preceding said Y active video and front porch samples of that QY component horizontal scan-line period, said third guard having a level substantially equal to said given blanking level and having a length equal to the sum of said third and fourth given integral numbers of sequential sample periods, said fourth guard having a level substantially equal to said given blanking level and having a length equal to said fifth given integral number of sequential sample periods, and said set of time-compressed Q samples having respective levels above said given blanking level and being comprised of said sixth given integral number of samples occupying sequential sample periods, with the respective levels of said set of time-compressed Q samples corresponding to a second set comprised of successive levels of C that occur during each of every 2nth sample period of the active video portion of a QY component horizontal scan-line period, said second-set 2nth sample period being phase displaced with respect to said first-set 2nth sample period by solely one sample period.

4,602,275

TELEVISION MEMORY SYSTEM

Terrence R. Smith, Haddon Township, Camden County, and Allen L. Limberg, Hopewell Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 19, 1984, Ser. No. 590,989

Int. Cl.[4] H04N *11/20, 9/64*

U.S. Cl. 358—11 **18 Claims**

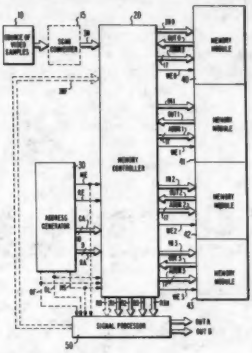
18. A memory system for the storage of sampled video signals comprising:

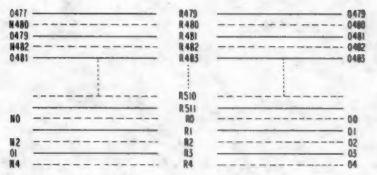
a source of sampled lines of raster scanned video signals;

an array of storage location each row of which includes a sufficient number of storage locations to contain the active portion of a line of sampled video signals and the rows of said array being sufficient in number to contain more lines of samples than are needed to hold the active lines of a field of raster scanned video signals;

means for accessing a plurality of said rows for simultaneously reading at least a first line of sampled video signals from said array and for writing at least a second line of sampled video signals into said array;

means for changing the addresses used by said accessing means in synchronization with the line and field advance rates of said source for writing corresponding lines of samples from successive fields into rows with successively smaller address values, modulo N, N being an integer





greater than the number of active lines in a frame but not greater than the number of rows of the array.

4,602,276

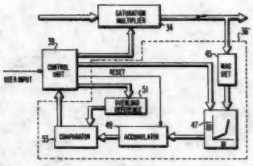
DIGITAL SIGNAL LEVEL OVERLOAD SYSTEM

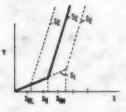
Russell T. Fling, Noblesville; Donald H. Willis, and David L. McNeely, both of Indianapolis, all of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 12, 1984, Ser. No. 599,531

Int. Cl.[4] H04N *9/68*

U.S. Cl. 358—27 **14 Claims**





1. Video signal processing apparatus for controlling the amplitude of a digital video signal comprising:

a source of digital video signal;

a multiplier having a signal input port coupled to said

source, having an output port at which amplitude controlled signal is available, and having a control input port;

a detector responsive to the magnitudes of said digital video signals for generating a control signal, said detector including a piecewise linear weighting means providing said detector with a first level of sensitivity to signal magnitudes less than a predetermined value and a second level of sensitivity to signal magnitudes above said predetermined value; and

means for coupling said control signal to said control input terminal.

4,602,277

PERMANENT COLOR CORRECTION PROCESS USING A SAMPLING AND AN AVERAGE COLOR DETERMINATION AND A SYSTEM USING THIS PROCESS

Jacques Guichard, 8, rue des Morillons, 75015 Paris, France

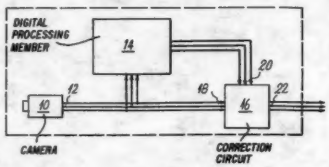
PCT No. PCT/FR83/00264, § 371 Date Aug. 27, 1984, § 102(e) Date Aug. 27, 1984, PCT Pub. No. WO84/02822, PCT Pub. Date Jul. 19, 1984

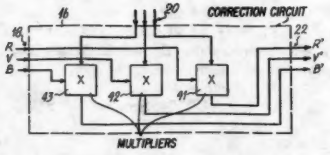
PCT Filed Dec. 28, 1983, Ser. No. 645,819

Claims priority, application France, Dec. 30, 1982, 82 22102

Int. Cl.[4] H04N *9/73, 9/68*

U.S. Cl. 358—29 **22 Claims**





1. Permanent colour correction process applicable to a video camera which produces primary signals able to characterize the colorimetric state of images constituted by points said process consisting in, during shooting, taking samples of signals relative to certain points of the images, storing in digital form a group of such samples relating to at least one image, digitally calculating the mean values of the samples stored, which defines an average colour, calculating correction coefficients on the basis of the average colour obtained and on a basis of a reference colour and which, when applied to the samples, define a corrected average colour, applying to all the signals supplied by the camera for all the points of the images, the thus calculated correction coefficients which supplies corrected signals and updating the calculation of the correction coefficients by using new samples corresponding to new images.

20. Permanent colour correction system associated with a video camera (10) producing signals able to characterize the brightness and colour of images constituted by points, said system comprising a digital processing member (14) which, during shooting, is able to take samples of the signals relative to certain points of the images, to store in digital form a group of these samples relating to at least one image, to digitally calculate the mean values of the stored samples which defines an average colour, to digitally calculate correction coefficients on the basis of the average colour obtained, said correction coefficients when applied to the samples defining a corrected average colour, and able to update the calculation of the correction coefficients; said system further comprising a correction circuit (16) with two inputs, one (18) being connected to the output of the camera (10) and receiving therefrom uncorrected signals and the other (20) connected to the processing member (14) and receiving therefrom the correction coefficients, and with one output (22) supplying corrected signals.

4,602,278

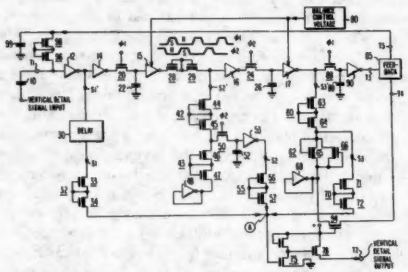
NON-LINEAR PROCESSOR FOR VIDEO SIGNAL VERTICAL DETAIL COMPONENT

Dalton H. Pritchard, Princeton Township, Mercer County, and Donald J. Sauer, Plainsboro Township, Middlesex County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 28, 1983, Ser. No. 555,587

Int. Cl.[4] H04N *9/64*

U.S. Cl. 358—37 **3 Claims**



2. Video signal processing apparatus comprising:

a source of video signals exhibiting small signal amplitudes over a first range, moderate signal amplitudes over a second range beyond said first range, and large signal amplitudes over a third range beyond said second range;

a first signal channel for conveying a linear version of video signals from said source with a given signal gain;

a second signal channel for conveying video signals from said source with a given signal gain, said second channel including a first amplifier exhibiting linear and limiting regions;

a third signal channel for conveying video signals from said source with a given signal gain, said third channel including a second amplifier exhibiting different linear and limiting regions compared to said first amplifier; and

means for combining output signals from said first, second and third channels to produce an output video signal; wherein

said first and second amplifiers are arranged in cascade relationship wherein said second amplifier responds to output signals from said first amplifier.

4,602,279

METHOD FOR PROVIDING TARGETED PROFILE INTERACTIVE CATV DISPLAYS

Michael J. Freeman, Sands Point, N.Y., assignor to ACTV, Inc., Port Washington, N.Y.

Filed Mar. 21, 1984, Ser. No. 591,862

Int. Cl.[4] H04N *7/10*

U.S. Cl. 358—86 **14 Claims**

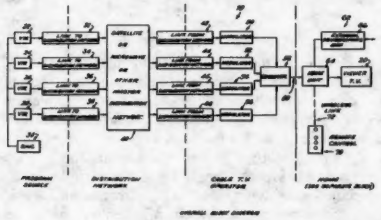
1. In a method for enabling a plurality of different continuous real time interactive television messages to be substantially simultaneously provided during a given prerecorded television program from a plurality of multichannel television receivers

comprising a one-way common television signal distribution network, the improvement comprising the steps of:

(a) transmitting a common television message and a plurality of different multichannel television messages over a plurality of contemporaneous channels, said transmitted different multichannel message comprising a plurality of different separately selectable substantially complete prerecorded television messages simultaneously transmitted in real time over said plurality of contemporaneous television channels to said plurality of multichannel television receivers through said one way distribution network, a single substantially complete television message being interactively selectable from said plurality of prerecorded television messages for providing a given one of said different continuous real time interactive television messages for a given one of said multichannel television receivers;

(b) providing said plurality of prerecorded television messages over said plurality of channels to said given one of said multichannel television receivers through said one-way distribution network from a multichannel storage means; and

(c) interactively selecting in real time one of said selectable prerecorded television messages from said plurality of prerecorded television messages for providing a portion of a television programming sequence program information content, a different interactive selection providing a different portion of a program information content for said television programming sequence, a different receiver being capable of independently selecting a different pro-



gram information content for said television programming sequence, whereby multiple users of said one-way distribution network may obtain an individualized program information content for said television programming sequence; said interactively selecting step further comprising the steps of interactively creating a selection profile for a subscriber and interactively selecting in real time one of said selectable prerecorded television messages from said plurality of prerecorded television messages based upon said selection profile, whereby a tailored program content for said television programming sequence for said subscriber is provided, each of said complete television messages in said plurality comprising a segway portion located in each of said channels for providing a visually continuous smooth information transition between said common television message and said television programming sequence, said television programming sequence and said common television message being adjacent in real time in said given television program.

7. In a method for enabling a plurality of different continuous real time interactive television messages to be substantially simultaneously provided during a given prerecorded television program from a plurality of multichannel television receivers comprising a one-way common television signal distribution network, the improvement comprising the steps of:

(a) transmitting a plurality of different multichannel television messages over a plurality of contemporaneous channels, said transmitted different multichannel messages comprising a plurality of different separately selectable substantially complete prerecorded television messages simultaneously transmitted in real time over said plurality of contemporaneous television channels to said plurality of multichannel television receivers through said one way distribution network, a single substantially complete television message being interactively selectable from said plurality of prerecorded television messages for providing a given one of said different continuous real time interactive television messages for a given one of said multichannel television receivers;

(b) providing said plurality of prerecorded television messages over said plurality of channels to said given one of said multichannel television receivers through said one-way distribution network from a multichannel storage means; and

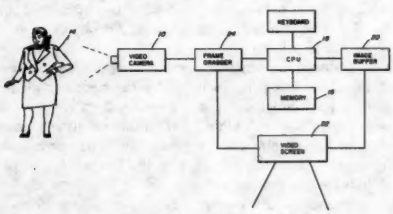
(c) interactively selecting in real time one of said selectable prerecorded television messages from said plurality of prerecorded television messages for providing a portion of a television programming sequence program information content, a different interactive selection providing a different portion of a program information content for said television programming sequence, a different receiver being capable of independently selecting a different program information content for said television programming sequence, whereby multiple users of said one-way distribution network may obtain an individualized program information content for said television programming sequence; said interactive selecting step further comprising the steps of interactively creating a selection profile for a subscriber and interactively selecting in real time one of said selectable prerecorded television messages from said plurality of prerecorded television messages based upon said selection profile, whereby a tailored program content for said television programming sequence for said subscriber is provided, said selection profile creating step comprising the step of varying said selection profile upon which said interactive selection is based, whereby said tailored program content is varied, said selection profile varying step comprising the steps of creating a selection profile set of parameters having at least one subset of said parameters and interactively selecting one of said messages based on said selection profile subset.

4,602,280

WEIGHT AND/OR MEASUREMENT REDUCTION PREVIEW SYSTEM

Laurence G. Maloomian, 764 Chestnut St., Needham, Mass. 02192

Filed Dec. 5, 1983, Ser. No. 557,750
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—93 **15 Claims**



1. A system for a weight and/or measurement reduction preview system which comprises:

means to record as a first image a customers body;

means to store the first image in horizontal raster lines;

means to enter information corresponding to the actual proportions of the customers body;

means to enter the information corresponding to the desired proportions of the customers body;

means to reproportion the pixels along the horizontal axis of each raster line by applying a stretch or shrink factor, said

factor applied to the difference between the actual dimensions and the desired dimensions to form a reproportioned raster line;

means to create a reproportioned figure of the customer based on said reproportioned raster line;

means to produce a new image based on the reproportioned original image; and

means to display said reproportioned image.

4,602,281

AUTOMATIC MEANS FOR CONTROLLING DOSAGE OF ILLUMINATING LIGHT FOR PICKING-UP IMAGE BY ENDOSCOPE ASSEMBLY

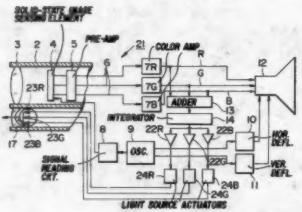
Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1984, Ser. No. 646,332

Claims priority, application Japan, Sep. 5, 1983, 58-163597

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—98 5 Claims



1. A system for automatically controlling the intensity of illuminating light in an endoscope assembly with an elongated insert member insertable into a cavity, said system comprising:

a variable intensity light source unit disposed at a tip of said insert member to vary the intensity of illuminating light in response to the application of a current or voltage thereto, said light source unit providing a plurality of different light colors;

an objective optical system disposed at the tip of said insert member for focussing the image of an object to be observed onto a focal plane;

a solid-state image sensing element disposed in said insert member, said sensing element having receiver elements disposed in said focal plane to provide a photoelectric conversion of the incident light on said receiver elements;

an actuating circuit means for providing signals corresponding to said receiver elements by the application of clock signals to said sensing element;

display means for displaying output color signals from said sensing element;

controlling means for providing control signals for controlling the intensity of said light source including,

(a) adder means for adding said color signals, and

(b) integrating means for integrating the output signals from said adder means; and

a light source actuating means connected to color outputs of said controlling means and to terminals of said light source for actuating said different colors of said light source individually and automatically in order to control the illumination intensity therefrom.

4,602,282

MEASURING DEVICES FOR TWO-DIMENSIONAL PHOTON-CAUSED OR CORPUSCULAR-RAY-CAUSED IMAGE SIGNALS

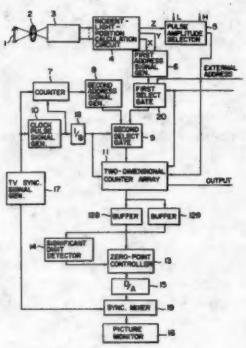
Takehiro Kurono; Yutaka Tsuchiya; Eiji Inuzuka, and Teruo Hiruma, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 21, 1983, Ser. No. 506,401

Claims priority, application Japan, Jun. 29, 1982, 57-112095; Oct. 8, 1982, 57-177158

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—110 26 Claims



1. A device for measuring two-dimensional photon-caused image signals which are generated due to photoelectrons which can separately be observed in a time sequence in response to light from an object being measured, comprising:

an imaging tube which includes a photoelectric layer to emit said photoelectrons when light from the object being measured is incident on said photoelectric layer, a microchannel-plate which has an electron emitting side and which multiplies each electron generated each time a unit of photons strikes said photoelectric layer so that said each electron is multiplied to provide a finite number of electrons which are emitted from said electron emitting side, and a two-dimensional semiconductor position sensor which has position signal electrodes and which is located adjacent the electron emitting side of said microchannel-plate, said micro-channel-plate being disposed between said photoelectric layer and said semiconductor position sensor;

incident-light-position calculation circuit means for issuing a position signal representing the location where said finite number of electrons strike said two-dimensional position sensor after an arithmetic operation is carried out on the outputs of the position signal electrodes of said two-dimensional semiconductor position sensor, said incident-light-calculation circuit means including a number-of-electrons calculation circuit means for estimating the number of electrons generated by adding said outputs of the position signal electrodes of said two-dimensional semiconductor position sensor, said numbers-of-electrons calculation circuit means providing an output signal having a signal component which results when a single photoelectron is generated on said photoelectric layer, a low-level thermal noise component, and a high-level noise component which results when a plurality of photoelectrons are generated simultaneously on said photoelectric layer;

pulse amplitude selector means for generating a decision signal to indicate whether or not the output signal of said number-of-electrons calculation circuit means corresponds to a single photoelectron level when said number-of-electrons calculation circuit means is operating, said

pulse amplitude selector means having an output port and providing a first threshold to dissect, at the output port thereof, said low-level thermal noise component from said signal component caused by a single photoelectron, and a second threshold to dissect, at the output port thereof, said high-level noise component caused by simultaneous occurrence of a plurality of photoelectrons from said signal component caused by a single photoelectron; and

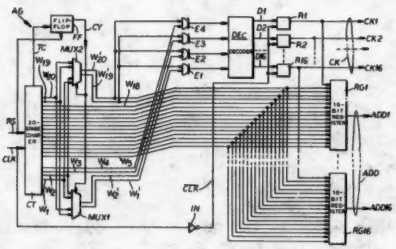
means including a two-dimensional counter array for adding one, every time a decision signal is generated by said pulse amplitude selector means, to the contents of a constituent counter at an address corresponding to said position signal issued by said incident-light-position calculation circuit means.

4,602,283

SYSTEM FOR SPATIALLY AND TEMPORALLY TRANSPOSING DATA WORDS ARRAYED IN PERIODICALLY RECURRING PATTERNS

Luigi Corgnier; Benedetto Riolfo, both of Turin, and Mario Guglielmo, Montalenghe, all of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Oct. 25, 1983, Ser. No. 545,142
Claims priority, application Italy, Oct. 25, 1982, 68237 A/82
Int. Cl.[4] H04N *7/167;* **H04L** *9/00;* **H04Q** *11/04*
U.S. Cl. 358—119 **11 Claims**



1. A system for transforming an incoming train of data words into a modified outgoing train retransformable into a replica of said incoming train after intermediate storage, comprising:

memory means with a multiplicity of storage units together having P·Z cells for accommodating a recurrent set of Z sequences of P data words of said incoming train;

input means connected in parallel to respective writing terminals of said storage units for supplying said incoming train thereto;

output means connected in parallel to respective reading terminals of said storage units for receiving said outgoing training therefrom;

addressing means connected to said storage units for identifying same in cyclic succession and selecting a cell of a storage unit so identified for reading and writing;

counting means for determining the end of a succession of P·Z data words in said incoming train;

distributing means responsive to said counting means for controlling said addressing means to establish either of two modes of selecting the cells in which data words are to be read and written, said modes including a first mode conforming to the order of occurrence of said data words in said incoming train and a second mode according to which homologous data words of said Z sequences are grouped into P consecutive series of Z data words each;

switchover means responsive to said counting means for modifying the operation of said distributing means after every succession of P·Z data words to change from one of said modes to the other; and

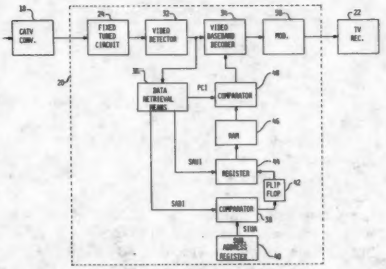
timing means synchronizing the operation of said counting means with the delivery of incoming data words by said input means, said timing means controlling said memory means in synchronism with the operation of said distributing means for commanding a readout of data words from selected cells and an immediately following writing of new data words therein during intervals which are relatively staggered for said multiplicity of storage units.

4,602,284

ADAPTER FOR RENDERING A NON-ADDRESSABLE CATV CONVERTER ADDRESSABLE

Gordon E. Kelly, Algonquin, and Mutsuo Nakanishi, Glen Ellyn, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 28, 1983, Ser. No. 470,881
Int. Cl.[4] H04N *7/167, 7/16*
U.S. Cl. 358—122 **5 Claims**



1. For use in a STV system which includes head-end means for transmitting an RF television signal having introduced therein a scrambled television signal characterized by encoded data reflecting subscriber address information, subscriber authorization information, and program code information,

the combination comprising:

a multitude of non-addressable subscriber installations each including a broad band converter capable of converting any transmitted RF television signal to an output signal having the frequency of a predetermined standard VHF television channel; and

an addressable adapter, responsive to said output signal of said converter for rendering a subscriber installation addressable, comprising;

a fixed tuned circuit coupled to the output of said converter and fixed-tuned to said predetermined standard VHF television channel;

data retrieval means responsive to the output of said fixed tuned circuit for retrieving therefrom said subscriber address information,

said subscriber authorization information, and

said program code information;

addressable data processing means responsive to a verification of said retrieved subscriber address information and to said retrieved subscriber authorization information for storing program authorization status for said installation,

said data processing means further responsive to said stored program authorization status and said derived program code information for developing, upon a correspondence therebetween, a decode enable signal;

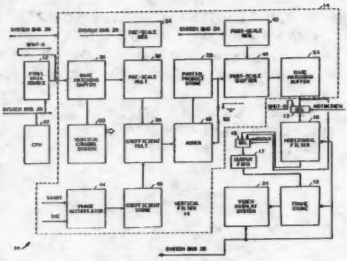
decoder means, having an input circuit responsive to the output of said fixed tuned circuit, and responsive to said decode enable signal for deriving an unscrambled television signal from said converter output signal; and

means for applying said unscrambled television signal to the RF input terminals of a television receiver.

4,602,285
SYSTEM AND METHOD FOR TRANSFORMING AND FILTERING A VIDEO IMAGE

Daniel A. Beaulier, Menlo Park, and Theodore A. Marsh, San Francisco, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 8, 1983, Ser. No. 483,424
Int. Cl.[4] H04N *5/14*; G09G *1/06*; G06F *7/38*
U.S. Cl. 358—160 **35 Claims**



32. A video still store system providing selected size compression of a video image comprising:

an image store storing at least one frame of video data defining a source image;

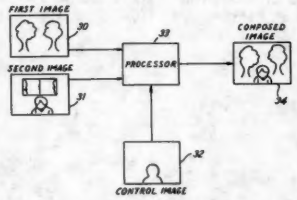
a filter system including serially coupled horizontal and vertical interpolation filters coupled to receive from the image store, and filter, a frame of video data defining an input source image received from the image store to produce a frame of output video data defining a target image having a selected size ratio relative to the input source image, the vertical filter having a first predetermined number of vertical filter points with respect to the target image and including for each said target image vertical filter point a vertical filter processor including a vertical filter partial product store storing a partial product sum for each video component of each target image sample data point in a target image video line and a vertical coefficient store having address inputs and storing at address locations corresponding to distances between a point in the target image and a current filter point in the target image a filter coefficient value selected to produce a desired horizontal filter response function, each vertical filter processor including means operable in response to each received source image data point value to obtain from the vertical coefficient store the filter coefficient value, to multiply the obtained coefficient value by the received source image data point value to produce a coefficient product and to increment the stored partial product sum corresponding to a current target image data point by the coefficient product until the point values for all of the source image data points which contribute to a target image filter point have been processed with a completed partial product sum being output when the data point values for all of the source image points which contribute to a target image point have been processed, the horizontal filter having a second predetermined number of horizontal filter points with respect to the target image and including for each said target image horizontal filter point a horizontal filter processor including a horizontal filter partial product store storing a partial product sum for each video component, and a horizontal coefficient store having address inputs and storing at address locations corresponding to distances between a point in the target image and a current filter point in the target image a filter coefficient value selected to produce a desired vertical filter response function, each vertical filter processor being operable in response to each received source image data point value to obtain from the horizontal coefficient store the filter coefficient value, to multiply the obtained coefficient value by the received source image data point value to produce a coefficient product and to increment the stored partial product sum corresponding to a current target image data point by the coefficient product until the data point values for all of the source image data points which contribute to a target image filter point have been processed with a completed partial product sum being output when the data point values for all of the source image points which contribute to the target image point have been processed; and

a frame store coupled to receive from the filter system, and store, a frame of output video data defining a target image.

4,602,286
VIDEO PROCESSING FOR COMPOSITE IMAGES

Paul R. N. Kellar, and Anthony D. Searby, both of Newbury, England, assignors to Quantel Limited, Berkshire, England

Filed Jan. 10, 1983, Ser. No. 457,098
Claims priority, application United Kingdom, Jan. 15, 1982, 8201136
Int. Cl.[4] H04N *5/262*
U.S. Cl. 358—183 **19 Claims**



6. An image composition system comprising:

first input means for providing a first source of picture information representing a first image;

second input means for providing a second source of picture information representing a second image;

means for providing a third source of picture information representing a control image;

manipulating means for selectively manipulating the picture information of said second and third sources to provide a common change in the spatial relationship of the respective image and control image from the second and third sources relative to the first image;

processing means for receiving information from said first source, and from said second source after manipulation, if any, by said manipulating means, and for providing therefrom a composed image; and

said processing means including control means responsive to said control image for varying the proportions of picture information from said first and second sources used by said processing means to provide said composed image, in dependence on the information from said third source.

4,602,287
INTERMEDIATE FREQUENCY FILTER WITH NYQUIST PHASE MODULATION CORRECTION

Pieter Fockens, Glenview, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

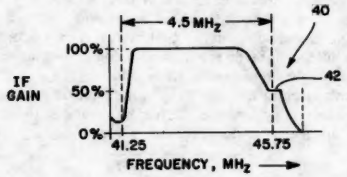
Filed Nov. 21, 1983, Ser. No. 554,154
Int. Cl.[4] H04N *5/62*
U.S. Cl. 358—197 **6 Claims**

1. In a television receiver having a video output stage and an audio output stage, the combination comprising:

means for converting a received RF television signal to an intermediate frequency signal comprising a frequency modulated intermediate frequency sound carrier and a

vestigial-side-band amplitude modulated intermediate frequency picture carrier;

intermediate frequency means for processing said intermediate frequency signal, said intermediate frequency means having a frequency response characteristic comprising a Nyquist slope centered about said intermediate frequency picture carrier, said Nyquist slope having a substantially constant gain response portion over a predetermined range of frequencies centered about said intermediate frequency picture carrier so as to substantially reduce



phase modulation of the intermediate frequency picture carrier in response to picture signal frequencies over said predetermined range;

video detector means responsive to said intermediate frequency means for developing an output comprising a baseband video signal and an intercarrier sound signal;

means for coupling said baseband video signal to said video output stage; and

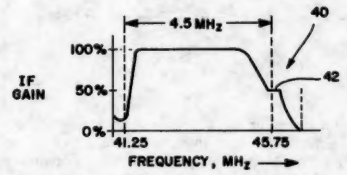
an intercarrier bandpass filter for coupling said intercarrier sound signal to said audio output stage.

4,602,288

INTERMEDIATE FREQUENCY SAW FILTER WITH NYQUIST PHASE MODULATION CORRECTION

Peter G. Everett, Wood Dale, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 21, 1983, Ser. No. 554,151
Int. Cl.[4] H04N *5/62;* H03N *3/08*
U.S. Cl. 358—197 7 Claims



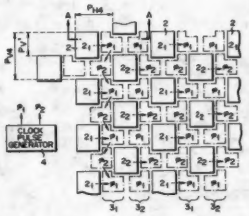
1. An acoustic surface wave intermediate frequency filter for an intercarrier sound television receiver comprising a substrate having formed thereon a plurality of transducers including at least an input transducer for receiving an intermediate frequency television signal having an intermediate frequency picture carrier and an output transducer, said transducers being configured for establishing for said filter a television signal intermediate frequency response characteristic including a Nyquist slope portion centered about said intermediate frequency picture carrier, said Nyquist slope portion of the intermediate frequency response characteristic being characterized by a substantially constant gain response over a predetermined range of frequencies centered about said intermediate frequency picture carrier so as to reduce phase modulation of the received intermediate frequency picture carrier in response to picture signal frequencies over said predetermined range.

4,602,289

SOLID STATE IMAGE PICK-UP DEVICE

Hirokazu Sekine, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1983, Ser. No. 497,130
Claims priority, application Japan, May 31, 1982, 57-92907; Mar. 22, 1983, 58-47497
Int. Cl.[4] H04N *3/14;* H01L *29/78*
U.S. Cl. 358—213 3 Claims



1. A solid-state image pick-up device comprising:

a first group of photosensitive pixels which are formed on a semiconductor substrate of one conductivity type and which are arranged in a first two-dimensional matrix form including columns;

a second group of photosensitive pixels which are vertically offset from said first group of photosensitive pixels by a distance corresponding to about half a vertical pixel pitch and are arranged in a second two-dimensional matrix form including columns so as to form a checkered pattern together with said first group of photosensitive pixels;

a plurality of vertical registers, each of which extends along a respective column of said pixels and comprises charge coupled elements having means for simultaneously transferring charges from said first and second groups of photosensitive pixels;

said charge transferring means comprising a plurality of charge transfer portions, each of which is arranged in a horizontal gap between obliquely adjacent ones of said pixels;

said vertical registers further having a plurality of charge storing portions, each of which is arranged in vertical alignment with a respective one of said charge transfer portions, extends to a gap between vertically adjacent ones of said pixels in each of said columns, and has a channel width wider than a channel width of said charge transfer portions; and

interlace reading means for sequentially reading out, in each horizontal scanning during readout of a first field, a signal from a vertically ith (i=1, 2, . . .) one of said pixels in each of said columns of said first group of photosensitive pixels and a signal from a vertically ith (i=1, 2, . . .) one of said pixels in each of said columns of said second group of photosensitive pixels in an order of i, and for sequentially reading out, in each horizontal scanning in readout of a second field, a signal from the (i-1)th (i=2, 3, . . .) one of said pixels in each of said columns of said first group of photosensitive pixels and a signal from an ith (i=2, 3, . . .) one of said pixels in each of said columns of said second group of photosensitive pixels in the order of i.

4,602,290

MOS-TYPE IMAGE SENSOR WITH BRANCH READOUT

Ryuji Kondo, Sunnyvale, and J. Gilbert Tisue, Los Altos, both of Calif., assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

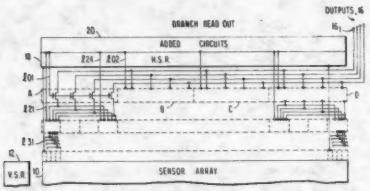
Filed Mar. 26, 1984, Ser. No. 593,170
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 9 Claims

1. An image sensor of the type including a plurality of output

terminals, a sensor array having a plurality of outputs, and readout means for selectively connectng outputs from said sensor array to said output terminals, said readout means comprising:

a first tier of traasfer transistors comprising a plurallty of first transistors greater in number than the number of said output terminals, each of said first transistors having a source and having a drain connected to one of said output terminals, said first transistors being arranged in first groups of first transistors, each first group including a first predetermined number of first transistors having their drains connected in common to one of said output terminals;

at least a second tier of transfer transistors comprising a



plurality of second transistors greater in number than the number of said first transistors, each of said second transistors having a source and having a drain coupled to the source of said first transistors, said second transistors being arranged in second groups of second transistors, each second group including a second predetermined number of second transistors having their drains connected in common to the source of one of said first translators in said first tier;

means for coupling sources of said second transistors to said sensor array outputs; and

control means for controlling the source-drain conductivity of said first and second transistors such that no more than one of the transistors in any first group is conductive at any one time.

4,602,291

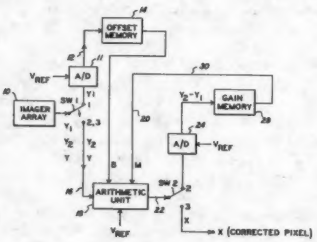
PIXEL NON-UNIFORMITY CORRECTION SYSTEM

Gabor C. Temes, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 9, 1984, Ser. No. 608,594

Int. Cl.[4] H04N *5/14*

U.S. Cl. 358—221 **7 Claims**



1. A pixel non-uniformity correction system for use in an imager (10) wherein said system operates in three separate modes, the improvement comprising:

offset memory means (14) coupled to said imager for storing the dark current signal from said imager in a first mode when no light is directed to said imager,

arithmetic unit means (18) coupled to said imager and said offset memory means for storing the signal from said imager in a second mode when a light of uniform, predetermined level is directed to said imager, said arithmetic unit means also subtracting the dark current signal received from said offset memory means from the signal generated upon application of said uniform light thereby generating a difference signal,

gain memory means (28) coupled to said arithmetic unit means for receiving and storing said difference signal, said gain memory means also coupled back to said arithmetic unit means for presenting said difference signal to said arithmetic unit means when the system is placed in a third, operating mode,

first switch means (SW2) for switching the output from said arithmetic unit means from said gain memory means to the system output such that said arithmetic unit means now compensates actual data signal from said imager upon data modulated light directed thereto for non-uniformities in each photosite of said imagers, and

second switch means (SW1) for coupling said imager to the offset memory means in the first mode and to the arithmetic unit means in the second and third modes.

4,602,292

DRIVING SYSTEM FOR MATRIX DISPLAY DEVICE

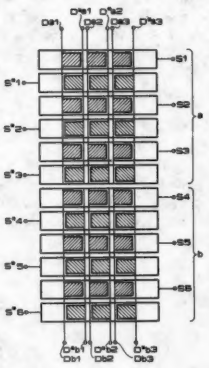
Seigo Togashi, and Shigeru Morokawa, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,566

Claims priority, application Japan, Mar. 16, 1983, 58-42239

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—241 **4 Claims**



1. Driving system for a matrix display device comprising display elements arranged in matrix form, row electrodes and column electrodes for driving said display elements, and driving means for applying driving signals corresponding to display information into said row electrodes and column electrodes, characterized in that display elements in even rows and display elements in odd rows are respectively driven by independent row electrode group and column electrode group.

4,602,293

MANUSCRIPT READING APPARATUS

Akio Sekine, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Apr. 17, 1985, Ser. No. 724,333

Claims priority, application Japan, Apr. 18, 1984, 59-57212[U]

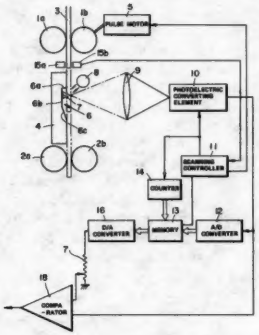
Int. Cl.[4] H04N *1/04, 1/40*

U.S. Cl. 358—280 **10 Claims**

1. In a manuscript reading apparatus comprising manuscript guide means disposed in a path of a manuscript and formed with a shading correction reference surface;

photoelectric converting means for reading said shading correction reference surface of said manuscript guide means and for reading a picture image of said manuscript when the same passes along said manuscript guide means;

memory means for storing an output of said photoelectric converting means when it reads said shading correction reference surface; and



correcting means for correcting the output of said photoelectric converting means when it reads picture images of said manuscript, in accordance with a content of said memory means,

the improvement wherein said manuscript guide means is provided with a recess in its guide surface and said shading correction reference surface is formed in said recess.

4,602,294

IMAGE REPRODUCING METHOD HAVING A RETOUCHING FUNCTION AND AN APPARATUS EMBODYING THE SAME

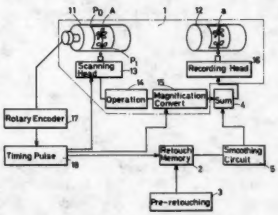
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jun. 1, 1983, Ser. No. 500,087

Claims priority, application Japan, Jun. 1, 1982, 57-94535

Int. Cl.⁴ G03F *3/08*; H04N *1/40*

U.S. Cl. 358—280 **13 Claims**



1. An image reproducing method having a retouching function, comprising the steps of:

(a) determining desired quantity and area of retouching which is obtained through simulation of an original picture under conditions substantially similar to those of a picture scanner device upon a monitored picture on a display device;

(b) storing data representative of said quantity of retouching into memory cells of a memory device, at addresses corresponding to said area of retouching;

(c) retrieving data of said quantity of retouching from particular memory cells synchronously with scanning signals representing elements of said original picture corresponding to said particular memory cells;

(d) adding the retrived data to said scanning signals to produce recording signals for reproducing a retouched image; and

(e) said adding step further comprising a smoothing step applied to said data retrieved from said memory device.

4,602,295

RECORDING AND REPRODUCING METHOD FOR VIDEO FORMAT SIGNAL

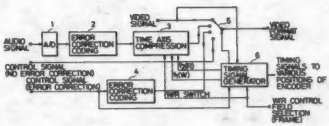
Yoshiaki Moriyama; Toshio Gotoh, and Hideki Hayashi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,910

Claims priority, application Japan, Oct. 23, 1982, 57-186565; Oct. 23, 1982, 57-186566; Oct. 23, 1982, 57-186567

Int. Cl.⁴ H04N *5/91*

U.S. Cl. 358—343 **10 Claims**



1. A method for recording and reproducing a video format signal of the type having a plurality of successive line signal portions, with each line signal portion including a horizontal synchronizing signal portion followed by an information signal portion, said video format signal corresponding to a two-dimensional image and containing both audio and video information, said method comprising the steps of:

dividing said two-dimensional image into a plurality of blocks;

inserting audio information into information signal portions of said video format signal corresponding to predetermined ones of said plurality of blocks and inserting video information into information signal portions of said video format signal corresponding to remaining blocks;

recording said video format signal on a recording medium;

reproducing said video format signal from said recording medium, said reproducing step including one of the steps of (1) masking said information signal portions of said video format signal corresponding to said predetermined blocks so that no video information is displayed in the corresponding predetermined blocks of said two-dimensional image, and (2) replacing the audio information inserted into information signal portions of said video format signal corresponding to said predetermined blocks with video information to be displayed in the corresponding predetermined blocks of said two-dimensional image.

4,602,296

SOUND RECORDING APPARATUS FOR ELECTRONIC STILL CAMERA

Makoto Murakoshi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 16, 1983, Ser. No. 494,897

Claims priority, application Japan, Jun. 10, 1982, 57-99700

Int. Cl.⁴ H04N *5/781*

U.S. Cl. 360—10.1 **6 Claims**

1. An electronic still camera comprising:

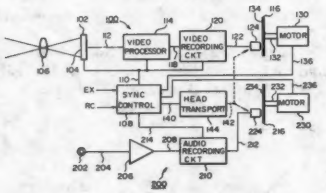
first recording means responsive to an exposure signal of a shot for sensing a still image of an object to record a video signal indicative of a still image time-serially on a first recording medium;

drive means for driving a second recording medium at a predetermined speed, the second recording medium being

in the form of an erasable and rewritable memory of a rotary element which has at least one recording unit, an audio signal being recorded recirculatively on the second recording medium;

second recording means for recording sequentially a time-serial audio signal on the second recording medium, said recording being preceded by the erasing of any previously recorded signal on said second recording medium, during a rotation of the second recording medium; and

a control circuit for controlling the drive means, and first and second recording means;



said control circuit causing, before a shot by the camera, an input audio signal to be recorded constantly on at least one recording unit of the second recording medium recirculatively by the second recording means, the control circuit responding to a shot by continuing the recording of the audio signal by the second recording means until a first period of time expires after the instant of the shot, whereby sound generated over a period of time inclusive of the instant of the shot is recorded on the second recording medium.

4,602,297

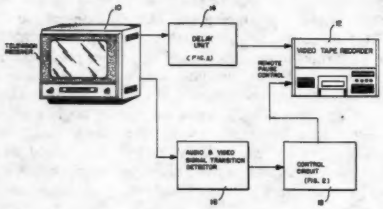
SYSTEM FOR EDITING COMMERCIAL MESSAGES FROM RECORDED TELEVISION BROADCASTS

Morris Reese, 1707 Fordham Ave., Thousand Oaks, Calif. 91360

Continuation-in-part of Ser. No. 693,380, Jan. 22, 1985, abandoned. This application Mar. 11, 1985, Ser. No. 710,379

Int. Cl.[4] H04N *5/782;* **G11B** *27/08*

U.S. Cl. 360—14.1 **9 Claims**



1. A system for deleting the commercial messages of a television signal when the television signal is recorded by a video tape recorder, said system including: a source of television signals; a tuner detector circuit connected to said source for producing video signals representative of selected television programs; a video tape recorder; a delay means connected to said tuner detector circuit and to said video tape recorder for applying video signals from said tuner detector circuit to said video tape recorder after a predetermined time delay has been imparted to the video signals, said predetermined time delay exceeding the total time duration of a group of successive commercials in the received television signals; a transition detector circuit connected to said tuner detector circuit for generating an output pulse indicative of each time a transition occurs in the video signals from said tuner detector circuit; and a control circuit connected to said transition detector circuit and to said video tape recorder and responsive to said output pulse from said transition detector circuit only when said output pulse is followed by one or more output pulses during a predetermined time interval for producing an editing control signal for the tape recorder, said control circuit responding to a sequence of successive pulses generated by said detector within said predetermined time interval to produce said editing control signal for the video tape recorder, said control circuit responding to said pulses occurring during said predetermined time interval to cause said video tape recorder to be activated at precisely the start of the first commercial message occurring during said predetermined time interval and to be reactivated precisely at the end of the successive commercial messages occurring during said predetermined time interval, and said control circuit including a first counter activated by a first pulse from said transition detector, and a second counter activated by said first pulse but reset by each succeeding pulse from said detector circuit generated during said predetermined time interval following said first pulse, said first pulse counter establishing the start of said editing control signal should it reach a count corresponding to said predetermined time delay, and said second counter establishing the end of said editing control signal should it reach a count corresponding to said predetermined time delay.

4,602,298

VIDEO TAPE RECORDER HAVING UNINTERRUPTED TRACKING CONTROL DURING INSERT EDIT MODE

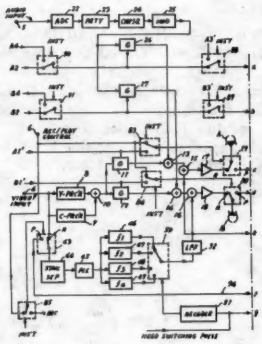
Yasuo Nishitani, and Osahiko Yano, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 6, 1983, Ser. No. 492,250

Claims priority, application Japan, May 7, 1982, 57-76818

Int. Cl.[4] G11B *5/02, 27/28, 27/30*

U.S. Cl. 360—14.1 **7 Claims**



2. A video tape recording and reproducing apparatus having recording, playback and edit modes, comprising:

a pair of first and second transducer heads mounted on diametrically opposite positions of the circumference of a rotary cylinder arranged to rotate about an axis tilted with respect to the direction of movement of a magnetic tape, said tape engaging the cylinder over an arcuate extent greater than a semicircle of the cylinder so that said transducer heads alternately produce a record of parallel oblique tracks of a length greater than said semicircle;

mode switching means for causing both of said transducer heads to operate as recording transducers during said recording mode and causing both of said transducer heads to operate as playback transducers during said playback mode;

pilot signal generating means effective during said recording mode for deriving a different pilot signal in synchronism

with each half revolution of said cylinder and applying said pilot signal to said transducer heads operating as recording transducers and effective during said playback mode for deriving said pilot signals from a signal detected by said transducer heads operating as playback transducers;

tracking signal generating means for deriving a tracking control signal from said pilot signal generating means and from each of said heads operating as a playback transducer;

means responsive to said edit mode for alternating the operating mode of said first transducer head between recording and playback transducers in synchronism with each half revolution of said cylinder and alternating the operating mode of said second transducer head in opposite relation to said first transducer head so that when the first transducer head is operating as a recording transducer tracing a major portion of a given track the second transducer head is operating as a playback transducer tracing a subsequent track to cause said tracking signal generating means to derive a tracking signal from a minor portion of said adjacent track; and

means for storing said tracking signal derived from said portion during the major portion of said subsequent track.

4,602,299

RECORDING APPARATUS WITH DEVICE FOR DETECTING THE STATUS OF A RECORDING MEDIUM

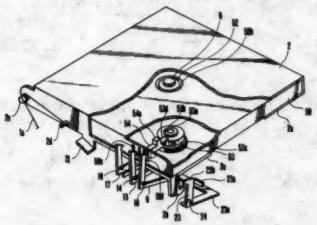
Syuichiro Saito, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 526,117

Claims priority, application Japan, Aug. 25, 1982, 57-147289

Int. Cl.[4] G11B *15/04, 23/02, 23/03, 19/04*

U.S. Cl. 360—60 **18 Claims**



1. A recording apparatus for use with a recording medium housed in a cassette, said cassette having means for indicating recording inhibition, said apparatus comprising:

a cassette loading station for loading thereon said cassette;

preventing means responsive to said recording inhibition indicating means of said cassette for preventing the cassette from being loaded on said cassette loading station when said recording inhibition indicating means is set to indicate recording inhibition;

cassette receiving means for receiving therein said cassette, said receiving means being movable to a predetermined position to load the cassette on said cassette loading station; and

latching means for latching said cassette receiving means at said predetermined position;

wherein said preventing means is arranged to disable said latching means when said recording inhibition indicating means of said cassette is set to indicate recording inhibition.

4,602,300

ADAPTER FOR A MINIATURE TYPE TAPE CASSETTE

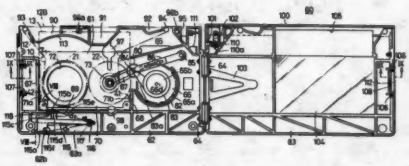
Haruki Ogata, Sagamihara; Kimio Ogawa, and Hiroyuki Umeda, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 340,097, Jan. 18, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 645,515

Claims priority, application Japan, Jan. 20, 1981, 56-7566

Int. Cl.[4] G11B *15/04, 19/04, 5/008, 15/00*

U.S. Cl. 360—60 **7 Claims**



1. An adapter for a miniature type video tape cassette having an external form and size which is smaller than the form and size of a standard type video tape cassette, said miniature type tape cassette being used with a recording and/or reproducing apparatus of a type which is different from a standard type of recording and/or reproducing apparatus which is primarily designed for performing recording and/or reproduction when loaded with said standard type tape cassette, and said miniature cassette having an erroneous erasure preventing tab which operates together with a detection mechanism of said recording and/or reproducing apparatus of the different type, said standard type recording and/or reproducing apparatus having a detection mechanism which operates together with an erroneous erasure preventing tab of said standard type tape cassette, said adapted comprising:

an adapter case with a top and a bottom, said adapter case having an external form and size substantially the same as the form and size of said standard type tape cassette;

an accommodating part for vertically accommodating said miniature type tape cassette which vertically enters at the top, passing into said accommodating part with movement toward the bottom of said adapter case;

tape guide means for guiding a magnetic tape drawn out of said miniature type tape cassette which is accommodated in said accommodating part and for forming a tape path within said adapter;

an erroneous erasure preventing means located within said adapter case and an urging means for urging said erroneous erasure preventing means in a direction for detecting and mechanically representing the existence and nonexistence of the erroneous erasure preventing tab of the miniature type tape cassette accommodated within said accommodating part, said erroneous erasure preventing means comprising a single swing lever pivoted at one end thereof, said swing lever

unitarily having a detecting part and a tab part and being urged by said urging means to press said detecting part so that said detecting part detects the existence and nonexistence of the erroneous erasure preventing tab of the miniature type tape cassette accommodated within said accommodating part;

said tab part projecting from one side of said swing lever and cooperating with the detecting mechanism of said standard type recording and/or reproducing apparatus;

said detecting part having a sloping part projecting from the other side of said swing lever and protruding into said accommodating part, said sloping part having a sloping surface which slopes downwardly toward the bottom of said adapter case so that said sloping surface is pushed by said cassette case when it vertically enters into said accommodating part, said sloping part receding from said

accommodating part when said sloping surface is pushed by said cassette case; and

said tab part and detecting part being located on an end of said swing lever which is opposite the pivoted end of said swing lever.

4,602,301

TWO SIDED MAGNETIC DISK DRIVE APPARATUS WITH CONTROLLED TIMING MEANS

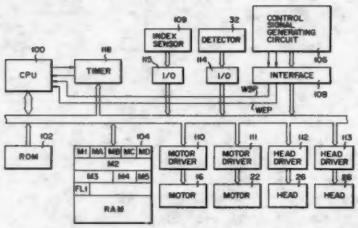
Shunji Saito, Numazu, and Tetsuro Ichitani, Mishima, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1984, Ser. No. 570,357

Claims priority, application Japan, Jan. 21, 1983, 58-8250

Int. Cl.[4] G11B *5/02, 21/08*

U.S. Cl. 360—69 **2 Claims**



1. A magnetic disk drive apparatus, comprising:

first drive means for rotating a magnetic disk having a plurality of tracks on each side, wherein said plurality of tracks on a first side of the magnetic disk are formed radially inwardly of those formed on a second side opposite said first side, respectively, and some of the tracks on said first side each have substantially the same diameter as a corresponding one of the tracks formed at the same position on the second side;

a data generating circuit for generating track position designation data and a side selection signal;

a magnetic head mechanism including first and second magnetic heads each having read/write and erase sections set apart by a predetermined distance along one of the tracks of said magnetic disk, and which magnetic heads oppose each other when the magnetic disk is inserted between said magnetic heads, the read/write and erase sections of said first magnetic head being positioned at predetermined distances from those of said second magnetic head in the radial direction of the magnetic disk;

second drive means for moving said magnetic head mechanism to a track position designated by the track position designation data and said side selection signal; and

control means for selectively starting and stopping the operation of said erase head sections when a delay time determined by the track position data and said side selection signal has passed after a corresponding start and stop of the operation of said read/write head sections in a write-in mode, the same delay time being provided by said control means for those tracks formed on both said first and said second sides of the magnetic disk and which have substantially the same diameter;

said control means comprising a track position data generating circuit for generating track position data representing the numbers of the two tracks on which said first and said second magnetic heads exist in response to said track position designation data; a selection signal generating circuit for generating an output signal from one of a plurality of output terminals which is selectively energized in accordance with the track position data from said track position data generating circuit and to said side selection signal; a plurality of delay circuits each having an associated delay time and which are respectively coupled to the output terminals of said selection signal generating circuit to be selectively energized by output signals from said selection signal generating circuit; the same delay circuit being energized when either of the tracks having substantially the same diameter on said first and said second sides of the magnetic disk is designated; and a write-in control signal generating circuit for directly supplying either of an operation start and an operation stop signal to the read/-write head section of a selected one of said first and second magnetic heads in the write-in mode, and for supplying one of the operation start and stop signal to the erase head section of said selected on of said first and second magnetic heads through one of said plurality of delay circuits.

4,602,302

AUTOMATIC REVERSING MECHANISM FOR CASSETTE TAPE RECORDING AND REPRODUCING APPARATUS

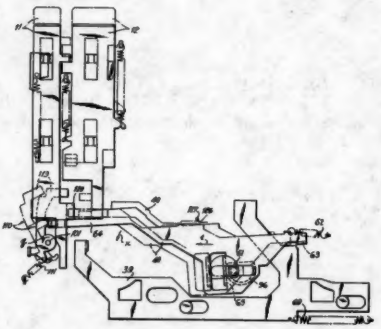
Masao Haruta, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,571

Claims priority, application Japan, Sep. 20, 1983, 58-173917

Int. Cl.[4] G11B *15/44, 15/22*

U.S. Cl. 360—74.2 **16 Claims**



9. Apparatus for controlling the operational mode of a magnetic tape cassette recording and reproducing system comprising:

a chassis;

a plurality of mode selecting levers slidably mounted on said chassis;

a tape drive device;

a slide lever slidably mounted on said chassis for movement between first and second positions, said tape drive device being operable in response to said positions of said slide lever;

spring means for biasing said slide lever into said first position;

locking means for locking said slide lever in said second position against the biasing of said spring means when one of said plurality of mode selecting levers selects a playback mode of operation, thereby moving said slide lever to said second position;

means for detecting the reaching of an end of said magnetic tape in said cassette being driven by said tape drive device;

a change lever slidably and rotatably mounted on said chassis for moving between first and second positions upon detecting the reaching of an end of said tape;

said change lever being rotated to an operative position presenting a slanted posture by one of said plurality of mode selecting levers selecting a recording mode, whereby said change lever presents said slanted posture

during said moving between first and second positions only in said recording mode; and

when said mode selecting lever is operated for the playback mode, said change lever, said locking means, and said slide lever cooperate so that said change lever moves said slide lever from said first position to said second position and moves said locking means to release said slide member from said second position, and when said mode selecting lever for the recording mode is operated the mode of said tape recording and reproducing system is changed over from the recording mode to a stop mode, in response to movement of said change lever from said first position to said second position while presenting said slanted posture.

4,602,303

COVER FOR THE LIGHT CHANNEL FOR A DEVICE FOR SWITCHING-OFF A MAGNETIC CASSETTE TAPE AT THE END OF ITS RUN

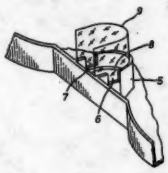
Albert Pertzsch; August Liepold, both of Munich; Hubert Brunner, Weil, and Ludwig Zeroni, Ottobrunn, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,664

Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416481

Int. Cl.[4] G11B *23/06*

U.S. Cl. 360—74.6 **3 Claims**



1. A cover for the light channel of a device for switching-off at the end of its run a magnetic cassette tape with a transparent leader tape, an opening being provided in the bottom part of the cassette for accommodating a lamp, the opening being defined by a one- or two-piece light shaft with slotted light channels for the passage of the beams of light towards light-receiving elements on the device, characterised in that the light shaft **5** located only in the bottom part of the cassette is provided with an encircling ledge **8** below the light channels **6, 7,** on which ledge a flexible piece of film **9** rests which is transparent at least in the region of the light channels, or that the light shaft, which is divided in the middle and fills out the height of the interior of the cassette housing, has an encircling ledge **8, 10** in each of the top and bottom parts **5, 5*a*** thereof, outside the region of the light channels, between which a flexible transparent piece of film **12,** rests and covers the light channels, the piece of film being supported on the inside wall of the light shaft.

4,602,304

SERVO PATTERN FOR DEDICATED SURFACE TRACK FOLLOWING SERVO SYSTEMS

Jack Fultz, Thousand Oaks, Calif., assignor to Pertec Peripherals Corporation, Chatsworth, Calif.

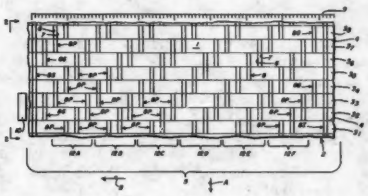
Filed Jun. 25, 1985, Ser. No. 748,745

Int. Cl.[4] G11B *5/55*

U.S. Cl. 360—77 **8 Claims**

1. For use in dedicated surface track following servo system, a disk having on one surface a plurality of radially spaced circumferential servo tracks on which magnetic patterns are pre-recorded, and a positionable magnetic pattern sensing transducer having a width twice the width of a servo track for simultaneously sensing the magnetic patterns in two adjacent servo tracks whereby position errors may be generated when said transducer is not centered on the boundry between selected adjacent servo tracks,

each of said servo tracks comprising a series of servo cells in each of which is recorded a pattern comprising in turn circumferentially spaced synchronizing information, repetitive servo position information, and track region indentifying information, and



wherein between said synchronizing and said servo position information, and between said servo position and track region identifying information, guard information is recorded in selected servo tracks, to avoid disruption of pattern uniformity.

4,602,305

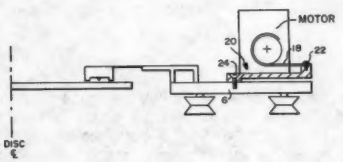
MAGNETIC DISC MEMORY APPARATUS INCORPORATING TEMPERATURE COMPENSATION

Sanjoy Ghose, Santa Cruz, Calif., assignor to Seagate Technology, Scotts Valley, Calif.

Filed May 23, 1983, Ser. No. 496,837

Int. Cl.[4] G11B *5/016*

U.S. Cl. 360—97 **19 Claims**



1. A disc drive system for reading data from a disc comprising a head for reading data tracks which are radially spaced from each other on said disc; means for radially moving said head relative to said disc comprising a flexure mounting said head, and a motor having a drive shaft, the output of said motor being coupled to said flexure through a drive band which winds and unwinds on said drive shaft; and means comprising a thermal compensation plate fixedly connected between said drive shaft and said flexure, said plate having a coefficient of thermal expansion selected to compensate for difference in thermal expansion of said radial head moving means relative to thermal expansion of said disc.

4,602,306

RECORDER/REPRODUCER APPARATUS WITH A DISC-SHAPED RECORD MEDIUM

Yasushi Noda, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,400

Claims priority, application Japan, Oct. 30, 1981, 56-174226; Oct. 30, 1981, 56-174227

Int. Cl.[4] G11B *17/04, 5/016*

U.S. Cl. 360—99 **7 Claims**

1. A recorder/reproducer apparatus wherein a disc assembly

is brought into transducing relation with a transducer head, the disc assembly having a recording disc rotatably encased in an envelope having central apertures formed in its opposite faces to partly expose the recording disc, the envelope also having an opening for allowing access of the transducer head to the recording disc, the apparatus comprising:

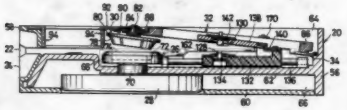
(a) a housing having an entrance slot for the insertion and withdrawal of the disc assembly along a predetermined plane to and from a preassigned working position in the housing for the transducing relationship with the transducer head;

(b) a drive hub assembly mounted within the housing in a concentric relation with the recording disc of the disc assembly when the latter is in the working position, the drive hub assembly being contiguous to a predetermined plane;

(c) a clamp assembly disposed on the opposite side of the disc assembly with respect to the drive hub assembly; and

(d) a swing arm rotatably carrying the clamp assembly and mounted within the housing for pivotal motion between a clamping position, where the clamp assembly engages between itself and the drive hub assembly the exposed portions of the recording disc through the central apertures of the envelope of the disc assembly in its working position, and an unclamping position where the clamp assembly disengages the recording disc, the clamp assembly being rotatable about a common access with the recording disc and the drive hub assembly when the swing arm is in the clamping position;

(e) drive means coupled to the drive hub assembly for rotating the same whereby the recording disc is rotated within the envelope jointly with the drive hub assembly and the



clamp assembly when the swing arm is in the clamping position;

(f) a handle mounted to the housing, in the immediate proximity of the entrance slot, for pivotal motion about an access parallel to the predetermined plane between an engaging position for engagement of the recording disc between the clamp assembly and the drive hub assembly and a disengaging position for the disengagement of the recording disc therefrom, the handle blocking the entrance slot against the passage of the disc assembly when in the engaging position and being held off the entrance slot when in a disengaging position; and

(g) a pusher on the handle for pushing the disc assembly, when the latter is incompletely inserted in the entrance slot, fully into the housing upon pivotal motion of the handle from the disengaging to the engaging position, the pusher having a sloping edge for sliding engagement with the disc assembly when the latter is being pushed into the housing, and a nonsloping edge for holding the disc assembly fully inserted in the housing when the handle is in the engaging position;

(h) a linkage operatively connecting the handle to the swing arm for shifting the latter from the unclamping to the clamping position upon pivotal motion of the handle from the disengaging to the engaging position and for shifting the swing arm from the clamping to the unclamping position upon pivotal motion of the handle from the engaging to the disengaging position;

(i) a disc guide mounted within the housing for pivotal movement between a guiding position, where the disc guide is contiguous to the predetermined plane for guiding the recording disc during insertion and withdrawal thereof to and from the working position, and a nonguiding position where the disc guide is away from the predetermined position;

(j) resilient means biasing the guide means from the guiding to the nonguiding position; and

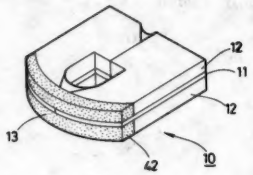
(k) means on the swing arm for pivoting the disc guide from the nonguiding to the guiding position against the bias of the resilient means upon pivotal movement of the swing arm from the clamping to the unclamping position and for allowing the disc guide to pivot from the guiding to the nonguiding position under the bias of the resilient means upon pivotal movement of the swing arm from the unclamping to the clamping position.

4,602,307

COMPOUND TYPE MAGNETIC HEAD

Jirou Toriu; Hiroshi Yamamoto, and Shoyu Watanabe, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1983, Ser. No. 474,340
Int. Cl.[4] G11B *5/12, 5/22*
U.S. Cl. 360—125 **1 Claim**



1. In a magnetic head for recording a signal on a magnetic tape of high coerciveness for reproducing the signal recorded thereon, a compound type magnetic head comprising:

a main core and two auxiliary cores sandwiching both sides of said main core therebetween, said main core being made of a magnetic material high in saturation flux density and low in inherent resistance and having a winding opening and a gap formed on the side against which said magnetic tape abuts, said auxiliary cores each consisting of a first member and a second member,

said first member having a winding opening in the position corresponding to said winding opening of said main core, a gap narrower than the maximum width of the winding opening thereof at a position opposing to the gap of said main core, and glass members disposed within the gap thereof, and being made of a material high in inherent resistance,

said second member being made of glass bonded to said first member so as to be located on the side against which said magnetic tape abuts and being made of a material lower in hardness than said main core,

said first member has two first member halves secured by glass depositing, and glass members disposed within said gap are used for glass depositing,

said second member is made of a material having a lower melting point than the glass members disposed within the gap of said first member.

4,602,308

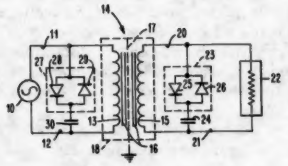
CIRCUIT FOR SUPPRESSING TRANSIENTS OCCURRING IN EITHER COMMON OR TRANSVERSE MODES

Herbert R. Montague, Binghamton, N.Y., assignor to Control Concepts Corporation, Binghamton, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,072
Int. Cl.[4] H02H *1/04*
U.S. Cl. 361—91 **5 Claims**

1. A circuit for suppressing coupling of common mode and

transverse mode transients on an a.c. power line to a load comprising a transformer having: (a) a primary winding adapted to be connected to the power line, (b) a secondary winding having a pair of output terminals adapted to be connected to the load, (c) inductive leakage reactance, (d) an electrostatic shield separating the primary and secondary windings, and (e) a structure electrically connected to the shield and arranged so that the common mode transients are shunted to the structure from the primary winding and the shield via electrostatic coupling between the primary winding and the shield; a low pass filter transverse mode transient



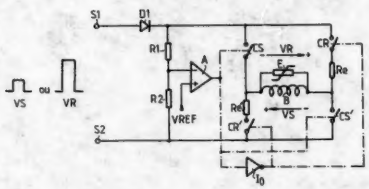
suppression network including as its only inductive reactance the transformer leakage reactance to substantially prevent core losses and core saturation and insert substantial reactive impedances in series with the load, and a shunt circuit across one of said windings, the shunt circuit including in series a capacitor and bi-directional breakdown means having a predetermined dead band threshold, the component values of the suppression network being such that the power line frequency is passed thereby without substantial attenuation and high frequency components of the transverse mode are substantially attenuated thereby after achieving the dead band threshold.

4,602,309

CONTROL CIRCUIT FOR A BISTABLE SOLENOID

Maurice Gaude, Le Saprey en Chartreuse, France, assignor to La Telemecanique Electrique, France

Filed May 9, 1985, Ser. No. 732,316
Claims priority, application France, May 9, 1984, 84 07110
Int. Cl.[4] H01H *47/00*
U.S. Cl. 361—210 **15 Claims**



1. Control circuit for a bistable solenoid of the type including a magnetic circuit comprising a permanent magnet which polarizes the magnetic field inside the circuit in the absence of any external field, and at least one coil (B) which, when crossed by a current, creates a field which entrenches itself or is added to the one created by the magnet in such as way as to lead a mobile device alternately into two stable positions (R) and (S) corresponding to a maximum reluctance and a minimum reluctance of the magnetic circuit,

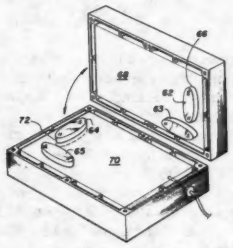
characterized in that it includes firstly, two control terminals (S_1, S_2) to which can be applied control pulses of at least two different types, i.e. a first pulse type (S) designed to obtain position (S) of the solenoid and which present a first level of amplitude, and a second pulse type (R) designed to obtain position (R) of the solenoid and which present a second level of amplitude different from that of pulses (S) of the first type and with the same polarity and secondly, a discrimination circuit (R_1, R_2, A) for pulses (R, S) of these two types according to their level of amplitude, this discrimination circuit (R_1, R_2, A) being connected to a switching circuit (CS, CS', CR, CR') controlling feed of the solenoid in such a way as to obtain a minimum reluctance of the magnetic circuit in response to pulses (S) of the first type and a minimum reluctance in response to pulses (R) of the second type.

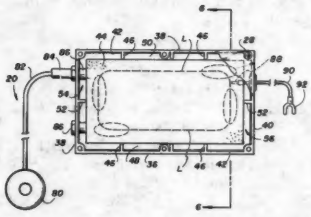
4,602,310

APPARATUS AND METHOD FOR DISSIPATING AND DISCHARGING ELECTROSTATIC CHARGES

Raynard M. Fenster, 4500 Lowell Blvd., Denver, Colo. 80211

Filed Mar. 25, 1985, Ser. No. 715,659
Int. Cl.[4] H05F *1/00*
U.S. Cl. 361—212 **27 Claims**





1. Apparatus adapted for dissipating and discharging electrostatic charge accumulated on an appliance, comprising:

an enclosure having an inner surface and an outer surface and formed of an insulating material;

a conductive foam body positioned in said enclosure;

magnet means in said enclosure and in contact with said foam mass for producing a loop-shaped magnetic field throughout the foam body;

a contact structure electrically connected to said foam body;

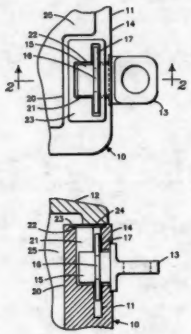
a ground wire electrically connected to said foam body at a point spaced from said contact structure and adapted to electrically connect said foam body to an electrical ground; and

a contact probe electrically connected to said contact structure and adapted to be electrically connected to said appliance whereby accumulated electrostatic charge on the appliance may be passed through the foam body to the ground potential.

4,602,311
STATIC PROTECTIVE HOUSING

Robert D. Lloyd, Sunrise; Irving H. Holden, Boca Raton, and Gerald E. Brinkley, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 4, 1984, Ser. No. 657,691
Int. Cl.[4] H05F *1/00*
U.S. Cl. 361—212 4 Claims

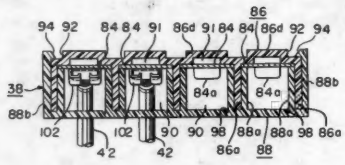


1. A static protective housing comprising:
a plastic housing having an outer wall and an interior,
a conductive member extending into the housing from the outer wall, and
a static vault located within the housing outer wall and receiving the conductive member for insulating the member from the housing interior,
the static vault being provided with a well portion for receiving the member, and a cover portion for closing the well portion to the interior of the housing,
a fastener element located in the well and engaging the conductive member for selectively retaining the member,
the static vault being integrally formed with the housing of plastic material, and
the static vault being integrally formed with the housing outer wall.

4,602,312
CONTROL BUS DEVICE

Masaru Takahashi, Gifu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,181
Claims priority, application Japan, May 31, 1983, 58-96263
Int. Cl.[4] H02B *13/02*
U.S. Cl. 361—342 8 Claims

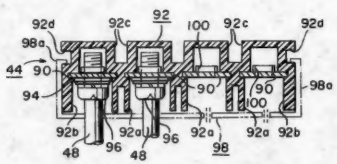


1. A control bus device in a casing containing a plurality of control units arranged in a tier, forming a control center, said control bus device comprising:
conducting bars;
a plurality of connecting means mounted on said conducting bars at predetermined locations;
branch lines connecting said control units and said conducting bars through said connecting means;
an insulating case receiving said conducting bars including a first insulator and a second insulator;
said first insulator having a base and sidewalls perpendicular to said base, said sidewalls being spaced apart a distance equal to the width of said conducting bars, forming compartments receiving said conducting bars parallel to and adjacent to said base so that adjacent conducting bars are insulated by said sidewalls;
said second insulator having a base and sidewalls perpendicular to said base, said sidewalls being arranged in pairs with one pair being located at each position corresponding to the sidewalls of said first insulator; said pairs of sidewalls being spaced apart to matingly receive said sidewalls of said first insulator, so that the ends of said sidewalls of said second insulator distal from said base of said second insulator contact said conducting bars on a surface opposite the surface adjacent the base of said first insulator; and
attaching means detachably connecting said first and second insulator to form said insulating case.

4,602,313
CONTROL CENTER WITH VERTICAL CONTROL BUS DEVICE

Masaru Takahashi, Gifu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,142
Claims priority, application Japan, May 31, 1983, 58-96261; May 31, 1983, 58-96262
Int. Cl.[4] H02B *13/02*
U.S. Cl. 361—342 6 Claims



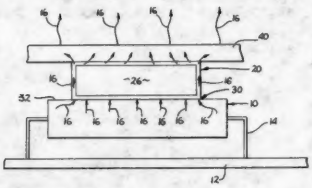
1. A control center with a vertical control bus device for distributing electric power from a power source to power consuming devices, comprising:
a casing containing therein a plurality of control units arranged in a tier, said casing further containing a vertical bus conductor section in its inner portion in which a plurality of vertical bus conductors are extended;
a vertical wiring section disposed beside said control units, said vertical wiring section being provided with external cables outgoing from said control units;
a control bus device for a control circuit which is used common to said control units, and which is arranged at a position opposite said vertical wiring section with respect to said control units, said control bus device including a plurality of conducting bars extending in the vertical direction being adjacent to said control units and having connecting points connecting branch lines to each of said control units, said branch lines being connected from each of said connecting points to each of said control units to form a control circuit for cross-wiring said control units.

4,602,314

HEAT CONDUCTION MECHANISM FOR SEMICONDUCTOR DEVICES

Neal E. Broadbent, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 14, 1983, Ser. No. 541,961
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—386 6 Claims



6. A mechanism dissipating heat from a plurality of integrated circuit packages mounted on a printed circuit board, comprising:

a plurality of resilient and deformable central bodies, each of said central bodies being formed into a contiguous strip;

a thermally conductive deformable metallic outer member substantially surrounding each of said central bodies said inner central body comprises a thermally non-conducting elastomer;

each of said central bodies being disposed such that each of said outer members are in physical contact with a plurality of said integrated circuit packages on said printed circuit board;

a metallic heat sink disposed above said plurality of central bodies and in physical contact with each of their outer members, such that heat eminating from said packages is conducted through said outer members and to said heat sink and radiated to the ambient environment.

4,602,315

COMPENSATING ROLL PIN FOR HEAT SINK MOUNTING

Leonard S. Breese, Carrollton, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

Filed Aug. 24, 1984, Ser. No. 644,215
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—388 7 Claims

1. An apparatus for mounting an electrical component to a circuit board, comprising:

a circuit board having at least one hole of a first predetermined diameter formed therein;

a heat sink defining an aperture having a cross section of a second predetermined diameter; and

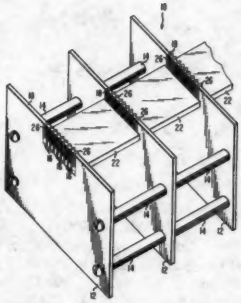
a roll pin formed from a deformable material and having a generally cylindrical shape, the roll pin having a first end portion, a middle portion and a second end portion, the external diameter of the middle portion being greater than the external diameter of the first and second portions, the first end portion being located in the aperture in the heat sink, a portion of the middle portion being deformed and located in the aperture to provide a tight fit between the roll pin and the heat sink with a substantial portion of the middle portion external of the aperture, the second portion being located in the hole in the circuit board in an interference fit with the board, and with the middle portion contacting the circuit board and spacing the heat sink a predetermined distance from the circuit board.

4,602,316

STRUCTURE AND METHOD FOR INTERCONNECTING PRINTED CIRCUIT BOARDS

Walter B. Feick, Oldwick, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1985, Ser. No. 717,721
Int. Cl.[4] H05K 1/14
U.S. Cl. 361—412 16 Claims



11. A structure including a plurality of interconnected printed circuit boards, each board having a plurality of spaced contact areas at an edge thereof, comprising an insulated multiconductor cable having a plurality of insulation-stripped window regions therein at predetermined levels, said cable being continuous through a plurality of said window regions and having a plurality of conducting wires juxtaposed in a substantially parallel relationship at said window regions, the window regions being positioned, respectively, adjacent said edges of the printed circuit boards so that, at each window region, each stripped wire is aligned with a different contact area and bent around said edge to have a U-shaped profile, said wires being soldered to their respective contact areas.

4,602,317

PRINTED WIRING BOARD CONNECTOR

Richard M. Rovnyak, Shaumburg, and Anthony Traina, Villa Park, both of Ill., assignors to GTE Communication Systems Corporation, Northlake, Ill.

Filed Dec. 13, 1984, Ser. No. 681,412
Int. Cl.[4] H01R 23/68
U.S. Cl. 361—413 16 Claims

1. In combination, a printed wiring board, a cable and a connector establishing connection between said printed wiring board and said cable, said printed wiring board including a plurality of terminals on a first side thereof and including a second side, said cable including a plurality of conductors each including a contact, and said connector comprising:

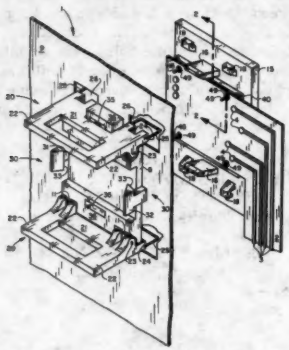
a base of planar construction positioned on a side of said cable away from said printed wiring board;

a planar frame attached to said printed wiring board second side;

a resilient pad positioned between said cable and said base;

guide means attached to said base and engaging said frame to engage said contacts with said terminals; and

clamping means securing said printed wiring board to said cable;



whereby, said printed wiring board is connected to said cable.

4,602,318

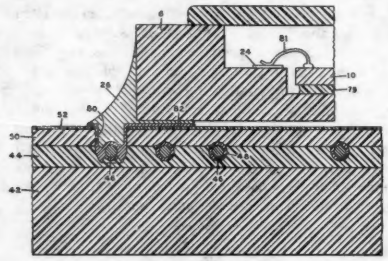
SUBSTRATES TO INTERCONNECT ELECTRONIC COMPONENTS

Charles L. Lassen, Cold Spring Harbor, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 254,132, Apr. 14, 1981, Pat. No. 4,500,389. This application Jul. 25, 1984, Ser. No. 634,091

Int. Cl.[4] H05K *1/18*

U.S. Cl. 361—414 **22 Claims**



1. An article for providing high density electronic networks comprising:

(a) a substrate;

(b) a plurality of filaments having at least one conductive portion;

(c) an encapsulating coating which maintains the positional stability of the filaments in relation to a datum, the surface of said coating being substantially smooth, flat and planar;

(d) at least one termination point comprising a cavity at a predetermined point in registration with a filament, said conductive portion of said filament being substantially exposed and traversing said cavity, such that the position of said filament is maintained by surrounding material comprising the encapsulating coating; and

(e) interfacing means at said predetermined points in contact with and substantially surrounding said filament, thereby interfacing the conductive portion of said filament with the external surface of said encapsulating coating.

4,602,319

RETRACTABLE HEAD-LIGHT DEVICE FOR AUTOMOBILES

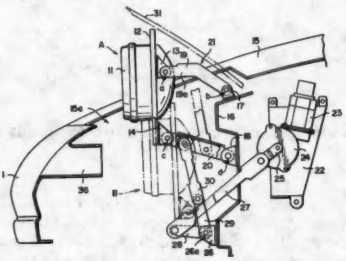
Naomune Moriyama, and Fumiyuki Ohtani, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 599,559, Apr. 12, 1984, abandoned. This application Sep. 27, 1985, Ser. No. 780,717

Claims priority, application Japan, Apr. 15, 1983, 58-67490; Apr. 15, 1983, 58-67491; Apr. 15, 1983, 58-57075[U]

Int. Cl.[4] B60Q *1/06*

U.S. Cl. 362—65 **10 Claims**



1. A head-light device for automobiles comprising head lamp means, lamp mounting means for mounting said head lamp means on an automobile body for movement between a retracted position wherein it is retracted within a contour of the body and an extended position wherein it is projected out of the contour of the body through opening means formed in the body, head lamp driving means for driving said head lamp means between said retracted and extended positions, lamp cover means provided above the head lamp means, cover mounting means for mounting said lamp cover means on the body for vertical swinging movement between a retracted position wherein it covers the opening means in the body and an extended position wherein it is projected above the contour of the body, said lamp cover means having a front edge which is substantially horizontal in a front view and inclined rearwards toward laterally outwards when the lamp cover means is in the retracted position, cover driving means for driving said lamp cover means so that it is moved together with the head lamp means, said cover mounting means including connecting means having one end connected with said lamp cover means and the other end connected with the body for providing a swinging axis below a rear part of said lamp cover means, said swinging axis extending substantially laterally of the body with an upward inclination toward laterally outwards such that the front edge of said cover means extends substantially horizontally in the extended position.

4,602,320

ADJUSTABLE SAFETY LAMP FOR VEHICLE WINDOWS

Douglas Tomkin, Happy Valley, and Mica Pavlovic, Shatin, both of Hong Kong, assignors to Redondo Investment Limited, Monrovia, Liberia

Filed Feb. 21, 1985, Ser. No. 703,772

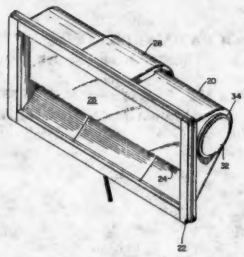
Int. Cl.[4] F21V *21/30*

U.S. Cl. 362—80 **15 Claims**

1. An adjustable lamp comprising:

a. a frame having adhesive means supported within its confines for securement to a supporting surface;

b. an outer housing having an open side secured at its perimeter to said frame; and



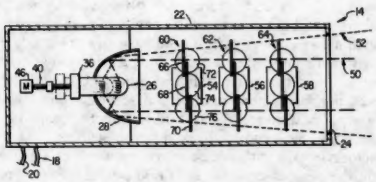
c. an energizable lamp rotatably supported within said outer housing, such that said lamp is directed towards the open side of said housing and through said frame.

4,602,321

LIGHT SOURCE HAVING AUTOMATICALLY VARIABLE HUE, SATURATION AND BEAM DIVERGENCE

James M. Bornhorst, Duncanville, Tex., assignor to Vari-Lite, Inc., Dallas, Tex.

Filed Feb. 28, 1985, Ser. No. 706,720
Int. Cl.[4] F21V *9/00*
U.S. Cl. 362—268 **47 Claims**



1. A light assembly comprising:

means for projecting a light beam;

a filter set including at least two filters, said set having each filter mounted on a means for pivoting, each said means for pivoting being rotatable about respective axes which are disposed perpendicular to said light beam and are in a common plane which is generally transverse to said light beam; and

said means for pivoting including means for concurrently pivoting said filters to selectively vary the angle of incidence of said light beam upon said filters to vary the resulting saturation and hue of said light beam.

4,602,322

TRANSISTOR RECTIFIER

Edwin B. Merrick, Stow, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 595,756, Apr. 2, 1984. This application Jun. 18, 1984, Ser. No. 621,401
Int. Cl.[4] H02M *7/217*
U.S. Cl. 363—127 **1 Claim**

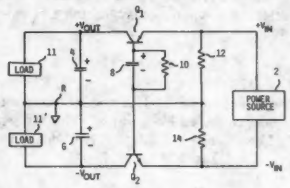
1. A power supply, comprising

a pair of input terminals between which an AC or DC power source may be connected,

a PNP transistor having electrodes respectively performing as an emitter, a collector and a base, said electrode performing as an emitter being connected to one of said input terminals,

a first output capacitor connected between said collector and a point of reference potential,

an NPN transistor having electrodes respectively performing as an emitter, a collector and a base, said latter electrode performing as an emitter being connected to the other of said input terminals,



a second output capacitor connected between said collector of said NPN transistor and the point of reference potential, and

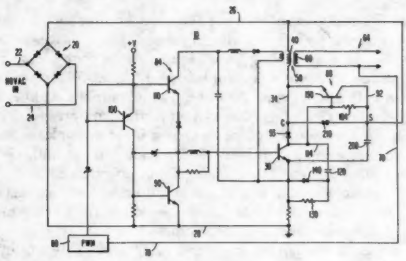
a resistor and a capacitor connected in parallel between the base of said PNP transistor and the base of said NPN transistor.

4,602,323

SINGLE-ENDED TRANSFORMER DRIVE CIRCUIT

Patrice R. Lethellier, Tamarac, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 5, 1984, Ser. No. 667,965
Int. Cl.[4] H02M *7/537*
U.S. Cl. 363—131 **3 Claims**



1. A transformer drive circuit including

a primary circuit and a secondary circuit and a transformer coupling said primary circuit and said secondary circuit, said transformer having a primary winding and a secondary winding, said primary winding having opposite first and second terminals, a source of dc voltage, said first terminal of said primary winding being coupled to said last mentioned voltage source;

a switching transistor having an emitter, a collector, and a base, the emitter of said switching transistor being coupled to a source of reference potential, first diode means coupling the collector of said switching transistor to said second terminal of said primary winding;

first circuit means coupled to said switching transistor for turning it on and off;

said switching transistor, when it is turned on, driving said transformer in the forward direction along its hysteresis curve and generating an output voltage in said secondary circuit; and

second circuit means including a second transistor having an emitter, a collector and a base, the emitter of said second transistor being connected to said second terminal of said

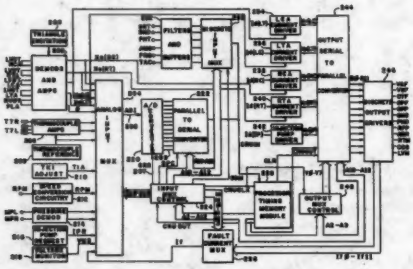
primary winding, second diode means coupling the collector of said second transistor to said second terminal of said primary winding, the base of said second transistor being connected to the collector of said switching transistor, capacitive means coupling the collector of said second transistor to the emitter of said switching transistor, and resistive means coupling the collector and base of said second transistor to each other, said second circuit means driving said transformer in the reverse direction along its hysteresis curve when said switching transistor turns off.

4,602,324

DIGITAL CONTROL SYSTEM

Charles S. Fujawa, and David J. Argyelan, both of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 16, 1983, Ser. No. 467,112
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—130 **15 Claims**



1. A digital control system having a processor for executing a program sequence stored in a memory, said processor and memory communicating with each other through a data bus, an address bus, and a control bus, said processor further provided with a serial input data line, a serial output data line, and a serial data clock line, said system further comprising:

an input section including an analog input multiplexer and a discrete input multiplexer, said analog input multiplexer having a plurality of analog input channels individually connectable to a single analog output and means, responsive to a channel address, for selecting the analog input channel connected to the output;

an analog to digital converter having a plurality of digital data outputs for representing a converted analog parameter, an analog input for receiving said analog parameter connected to the output of said analog input multiplexer, a conversion request line for initiating an analog to digital conversion, and an additional digital output line for indicating when a conversion has been completed;

a parallel to serial converter responsive to a selection signal, having a plurality of digital inputs connected to the digital outputs of said analog to digital converter and operable to shift the bits on its inputs onto a serial output line which is connected to said serial data input line of said processor;

an input multiplexer control for generating said channel address for said analog input multiplexer, said conversion request for said analog to digital converter, said selection signal for said parallel to serial converter, and a selection signal for said discrete input multiplexer from information on said address bus and said serial data clock line;

an output section including a serial to parallel converter having a data input connected to said output data line of the processor and a plurality of digital outputs individually connectable to said data input, and further having means, responsive to an output channel address, for selecting the digital output connected to said input;

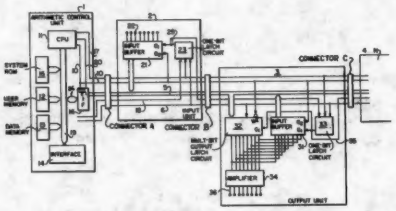
an output multiplexer control for generating said output channel addresses from information on said address bus and said serial data clock line.

4,602,325

PROGRAMMABLE CONTROLLER

Naohiro Kurokawa, Niigata, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1984, Ser. No. 585,552
Claims priority, application Japan, Dec. 16, 1983, 58-236107
Int. Cl.[4] G06F *15/46;* **G05B** *19/00*
U.S. Cl. 364—140 **14 Claims**



9. A programmable controller comprising:

an arithmetic control unit for executing logic operations with input signals to provide output signals, and for generating address signals;

a unit bus for transmitting said input and output signals;

an address bus for transmitting said address signals;

an input unit connected to said arithmetic control unit by said unit bus and address bus for receiving said input signals to be transmitted through said unit bus to said arithmetic control unit, on the basis of commands of said arithmetic control unit and having a selection latch circuit appointing the corresponding input units responsive to said unit bus when latching said address signals; and

an output unit connected to said arithmetic control unit by said unit bus and address bus for sending said output signals of said arithmetic control unit through said unit bus on the basis of commands of said arithmetic control unit, and having a selection latch circuit appointing the corresponding output unit responsive to said unit bus when latching said address signal;

said selection latch circuits being connected to the respective units by said address bus whereby said address signal supplied to said external units may be transmitted to said selection latch circuits of succeeding-stage units.

4,602,326

PATTERN-RECOGNIZING SELF-TUNING CONTROLLER

Thomas W. Kraus, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Dec. 12, 1983, Ser. No. 560,617
Int. Cl.[4] G05B *13/02, 13/00*
U.S. Cl. 364—158 **38 Claims**

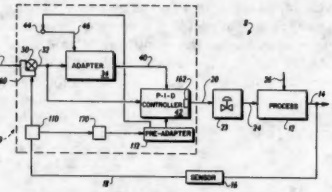
1. A pattern-recognizing self-tuning controller apparatus for use in a control system, wherein said controller apparatus includes a controller which is coupled to a process in a closed loop of said control system for controlling a process controlled variable having set point and measured values, said controller having a control action which is determined by at least one operating parameter so that the controller is responsive to a difference between said set point and measured values; said controller apparatus comprising:

first comparator means responsive to differences between said set point and measured values for generating a closed-loop behavior signal,

detector means responsive to the close-loop behavior signal

of said process control variable for measuring a pattern characteristic thereof and producing a measured value of said pattern characteristic

second comparator means being coupled to said detector means and operating to compare said pattern characteristic measured value with a predetermined desired value for the pattern characteristic; and



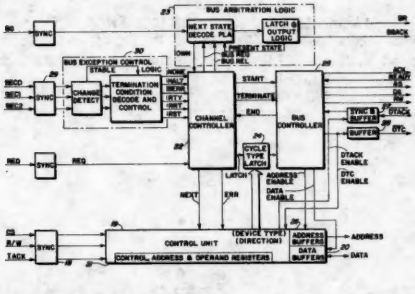
adjusting means coupled to said second comparator means for responding to a difference between said measured and desired values of the pattern characteristic so that the measured value substantially matches the set point value, said adjusting means not operating to alter said operating parameter of the controller when the difference between said measured and desired values is less than a prescribed difference.

4,602,327

BUS MASTER CAPABLE OF RELINQUISHING BUS ON REQUEST AND RETRYING BUS CYCLE

William P. LaViolette; David S. Mothersole, and John Zolnowsky, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1983, Ser. No. 518,494
Int. Cl.[4] G06F *13/14*
U.S. Cl. 364—200 **1 Claim**



1. In a bus master comprising:

bus exception control logic coupled to a communication bus, for receiving externally generated bus exception condition signals, and providing a no-exception signal in response to receiving a first predetermined one of the bus exception condition signals and a bus relinquish and retry signal in response to receiving a second predetermined one of the bus exception condition signals;

bus arbitration logic coupled to the communication bus, for arbitrating for control of the bus in response to a bus request signal, providing a bus available signal upon being granted control of the bus, and releasing the control of the bus only in response to a bus release signal; and

bus control logic coupled to the bus exception control logic and to the bus arbitration logic, for providing the bus request signal in response to an operation request signal, utilizing the bus to perform a selected sequence of predetermined, indivisible operations in response to the bus available signal, and thereafter providing the bus release signal upon receiving the no-exception signal from the bus exception control logic;

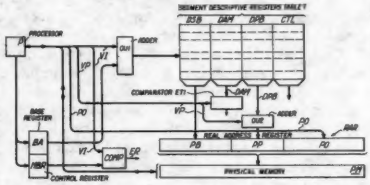
the improvement comprising means in the bus control logic for receiving the relinquish and retry signal, and, in response thereto, halting immediately the performance of the particular operation then being performed and then providing the bus release signal to the bus arbitration logic, said means thereafter providing the bus request signal to the bus arbitration logic in response to the termination of the bus relinquish and retry signal and then resuming the performance of the sequence of operations at the beginning of the particular operation which was halted when the bus arbitration logic again provides the bus available signal.

4,602,328

MANAGEMENT SYSTEM FOR THE MEMORY OF A PROCESSOR OR MICROPROCESSOR

Ulrich Finger, Clamart; Pierre Ligneres, Antony, and Ciaran O'Donnell, Paris, all of France, assignors to L'Etat Francais represente par le Ministre des P.T.T. (Centre National d'Etudes des Telecommunications) and Institut National de Recherche en Informatique et en Automatique, both of Paris, France

Filed Dec. 17, 1982, Ser. No. 450,668
Int. Cl.[4] G06F *12/10*
U.S. Cl. 364—200 **6 Claims**



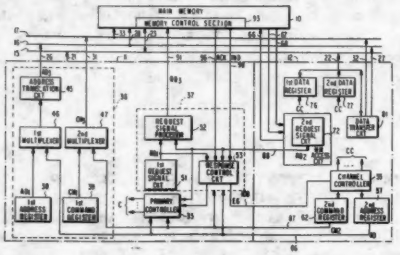
1. A system for the management of the physical memory of a processor, incorporating a table of segment descriptive registers connected to the processor and to means for transforming a virtual address supplied by the processor into a physical address in order to permit the performance of a task, on the basis of real pages and segments contained in a physical memory, said virtual address containing at least one virtual page number, the binary value of a checking index of a first descriptive register of a physical segment in the memory corresponding to a task to be performed, and the offset value of the start of the physical segment, with respect to the start of the corresponding real page, wherein it also comprises a base register which is loaded, for each virtual address, by the base address of the first descriptive register corresponding to the task to be performed, said base address being supplied by the processor, the descriptive register table having inputs connected to the outputs of a logic adder, which receives on the one hand the binary value of the base address of the first descriptive register, and on the other hand the binary value of the index corresponding to the first descriptive register corresponding to the task to be performed, the outputs of the adder addressing one of the inputs of the descriptive register table, wherein the segment descriptive registers of the table contain control bits, the processor being enabled by the control bits of the segment to which the processor must have access, to check whether said processor must operate in the local or overall mode, and whether it must process an input - output operation, or an access to the memory.

4,602,329

DATA PROCESSING SYSTEM HAVING AN ADDRESS TRANSLATION UNIT SHARED BY A CPU AND A CHANNEL UNIT

Akihito Ohtake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,961
Claims priority, application Japan, Mar. 23, 1983, 58-48233
Int. Cl.[4] G06F *12/10, 13/12*
U.S. Cl. 364—200 **4 Claims**



1. In a data processing system for use in accessing a main memory from each of a central processing unit and a channel unit through a data bus shared by said central processing and said channel units, said central processing unit comprising first access signal producing means for producing a first access signal and first request signal producing means for producing a first request signal, and channel unit comprising second access signal producing means for producing a second access signal and second request signal producing means for producing a second access signal, said main memory producing an acknowledgement signal when accessed, the improvement wherein said central processing unit further comprises:

first delivering means responsive to a selected one of said first and second access signals for delivering a third access signal to said main memory through said data bus;

second delivering means operatively coupled to said first delivering means for delivering one of said first and said second request signals to said main memory that is selected in correspondence to said selected one of said first and said second access signals; and

energizing means operatively coupled to said second delivering means and at least to said second request signal producing means and responsive to said acknowledgement signal for energizing said channel unit with said data bus assigned to said channel unit when said second request signal producing means produces said second request signal and said second delivering means delivers said second request signal as said one of the first and the second request signals.

4,602,330

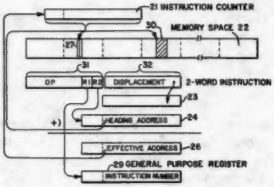
DATA PROCESSOR

Fumihiro Ikeya, Kashiwa, Japan, assignor to Panafacom Limited, Kawasaki, Japan

Continuation of Ser. No. 617,849, Jun. 8, 1984, abandoned, which is a continuation of Ser. No. 315,878, Oct. 28, 1981, abandoned, which is a continuation of Ser. No. 165,045, Jul. 1, 1980, abandoned, which is a continuation of Ser. No. 954,530, Oct. 25, 1978, abandoned. This application Dec. 28, 1984, Ser. No. 685,613
Claims priority, application Japan, Oct. 1, 1977, 52-131365
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **8 Claims**

1. A data processor for processing data in the form of n-bit words according to program instructions, each said instruction being constituted of a selected respective number of n-bit words, said processor being used in conjunction with an external memory for storing 2^{n+m} n-bit words, where n and m are integers, said memory generally storing plural programs, each program and/or sub-routine executing only within its allocated 2^n memory space and being less than or equal to 2^n words in length, said processor comprising:

a plurality of n+m bit general purpose registers, each having an n bit portion and an m bit extension portion, said extension portion used only for addressing, each of said general purpose registers acting as both an operand data handling register and as a combined base and index register and suitable for storing one of said n-bit data words used as the operand data, or as an address expansion register for storing a respective predetermined (n+m)-bit



heading address used as the base and index address for one of the programs stored in said memory, each said heading address of each said program being the sum of an (n+m)-bit base address and an n-bit index address; and

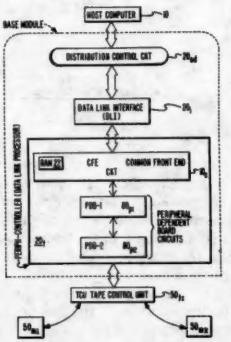
a single 2-input adder, operatively connected to said general purpose registers, for determining a (n+m)-bit effective address, for accessing said memory according to the instructions of the selected program, each said instruction for accessing said memory including a register designation part in one word of the instruction and an n-bit displacement in another word of the instruction, by adding said n-bit displacement with the (n+m)-bit content of the designated general purpose register.

4,602,331

MAGNETIC TAPE-DATA LINK PROCESSOR PROVIDING AUTOMATIC DATA TRANSFER

Jayesh V. Sheth, El Toro, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 30, 1983, Ser. No. 509,582
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—200 **4 Claims**



1. A peripheral-controller for executing data transfer operations between a buffer memory means in said peripheral-controller and a main host computer or a magnetic tape peripheral unit, the peripheral-controller comprising:

(a) a common front end circuit unit for sequencing micro-code

instructions to effect data transfers of blocks of data between said buffer memory means and said host computer or said magnetic tape peripheral unit, said front end circuit unit being initiated by command from said host computer and including:

(a1) buffer memory means for temporary storage of data-in-transit between said magnetic tape peripheral unit and said host computer, said buffer memory means organized into a plurality of n data storage blocks whereby each block stores a plurality of data words;

(a2) instruction sequencing means providing control signals to a peripheral dependent circuit unit;

(a3) means to receive block status information signals from a means for registering the number "n" of full data blocks residing in said buffer memory means;

(a4) means for generating control signals for said peripheral dependent circuit unit, said means operating in response to receipt of said block status information signals;

(b) said peripheral dependent circuit unit operating under control of said common front end circuit unit and functioning to control data transfers into and out of said buffer memory means to and from said host computer or said magnetic tape peripheral unit, said peripheral dependent circuit unit including:

(b1) means to execute automatic read operations for transferring blocks of data from said magnetic tape peripheral unit to said buffer memory means;

(b2) means to execute automatic write operations for transferring blocks of data from said buffer memory means to said magnetic tape peripheral unit;

(b3) first means to transfer data from said host computer to said buffer memory means, and second means to transfer data from said buffer memory to said host computer, said first and second means to transfer including:

(b3-1) burst mode transfer means for transferring one or more full blocks of data between said buffer memory means and said host computer with a single instruction from said common front end circuit unit;

(b4) said means for registering a number "n" of full data blocks residing in said buffer memory means, and for providing a block status information signal to said common front end circuit unit, said means for registering including:

(b4a) address register means for receiving address data to be used in accessing locations in said buffer memory means and for providing numerical data signals to a block counter logic unit wherein said numerical data signals indicate the amount of data transferred into and the amount of data transferred out of said buffer memory means;

(b4b) a block counter logic unit connected to receive said numerical data signals from said address register means and to provide first and second logic output signals to a gating means;

(b4c) said gating for permitting said first and second logic output signals to operate a counter means, said first and second output signals operating to shift up or shift down the count in said counter means;

(b4d) said counter means functioning to maintain a count of the number "n" of full data blocks residing in said buffer memory means.

4,602,332

AUTOMATIC BANK NOTE TRANSACTION APPARATUS

Minoru Hirose, Yokohama, and Teruaki Kimura, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 26, 1984, Ser. No. 574,246

Claims priority, application Japan, Jan. 26, 1983, 58-11183

Int. Cl.[4] G06F *15/30*

U.S. Cl. 364—408 **14 Claims**

1. An automatic bank note transaction apparatus comprising:

a housing formed with a bank note receiving port and a bank note dispensing port;

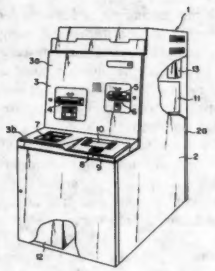
first storing means, disposed in said housing, for storing bank notes;

discriminating means for examining bank notes passing therethrough and generating a discrimination output indicative thereof;

first conveying means for conveying bank notes inserted through said bank note receiving port to said first storing means, said first conveying means operating along a first convey path which passes inserted bank notes through said discriminating means, said discriminating means performing a first examination operation on said inserted bank notes passing therethrough,

second conveying means for conveying the bank notes stored in said first storing means to said bank notes dispensing port, said second conveying means operating along a second convey path which passes said stored bank notes through said discriminating means, said discriminating means performing a second operation on the stored bank notes passing therethrough;

means for initiating a final examination operation to be performed on the bank notes in said first storing means;



second storing means for storing the bank notes after they have been examined during the final examination operation;

third conveying means for conveying the bank notes stored in said first storing means to said second storing means when the final examination operation is initiated, said third conveying means operating along a third convey path which passes the bank notes from said first storing means through said discriminating means, said discriminating means performing a final examination operation on the bank notes passing therethrough;

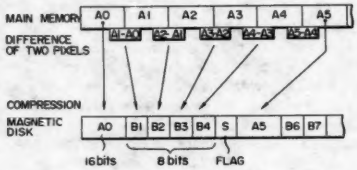
counting means for summarizing the discrimination outputs produced during said final examination operation; and

output means for generating a final examination output when said final examination operation is completed, said final examination output being indicative of the bank notes passing along said third convey path based on the discrimination outputs summarized by said counting means, said output means thereby producing a summary of the bank notes remaining in said first storing means during a final examination operation.

4,602,333
STORAGE OF IMAGE DATA IN BOTH ORIGINAL AND COMPRESSED FORMS

Tomoyasu Komori, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Sep. 14, 1984, Ser. No. 650,855
Claims priority, application Japan, Sep. 16, 1983, 58-170905
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—414 **8 Claims**



1. A tomographic image processing apparatus comprising:

means for producing a plurality of image data of an object under examination;

main memory means for storing said plurality of image data;

means for compressing said image data so as to derive compressed image data;

means for writing non-compressed image data derived from said main memory means and said compressed image data, said both image data being originated from one of said plurality of image data;

storage disk means having at least first and second storage areas, whereby said compressed image data is stored in said first storage area and said non-compressed image data is stored in said second storage area under the control of said write means in such a way that said compressed image data has priority over said non-compressed image data in the storage operation;

means for reading said non-compressed image data when said compressed and non-compressed image data are stored in said storage disk means;

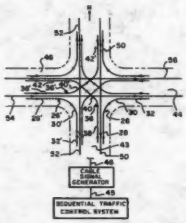
means for expanding said compressed image data upon said compressed image data being read from said read means, and;

means for image-processing at least one of said non-compressed image data and said expanded compressed image data transferred via said main memory means from said read means and said expansion means respectively.

4,602,334
VEHICLE TRAVEL CONTROL DEVICE

Leonard Salesky, 41 Polk St., Riverside, N.J. 08075

Filed Oct. 31, 1983, Ser. No. 546,969
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424 **24 Claims**



13. A system to control a vehicle equipped to receive signals and therefrom control its direction of travel comprising:

(a) a first cable system means in a travel surface defining a first direction of travel to carry and radiate a signal from a first generator means generating a guidance signal, wherein the signal is received by a first receiving means in the vehicle,

(b) at least one second cable system means in the travel surface at any location where a change from the first direction of travel is desired to carry and radiate a signal from a second generator means to generate a guidance signal and a signal indicating the speed of travel of the vehicle during the change in direction, wherein the signal is received by a second receiving means in the vehicle, the second cable system means comprising at least one cable means comprising:

(i) a first length of cable parallel to the first direction of travel,

(ii) a second length of cable abutting but not connected to the end of the first length and following a direction of travel diverging from the first direction of travel, and

(iii) a third length of cable abutting but not connected to the end of the second length and following a direction of travel parallel to a second direction of travel.

(c) third cable system means in a the travel surface defining the second direction of travel to carry and radiate a signal from a third generator means generating a guidance signal and a signal indicating the appropriate speed of travel along the second direction of travel,

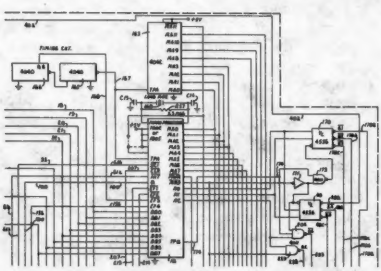
wherein the relative distance between the first cable system and the first length of cable of the second cable system means corresponds with the distance between the centers of the capture ranges of the first receiving means and the second receiving means, and

wherein the relative distance between the third length of cable of the second cable system means and the third cable system means corresponds with the distance between the centers of the capture ranges of the first receiving means and the second receiving means.

4,602,335
FUEL EFFICIENT CONTROL OF MULTIPLE UNIT LOCOMOTIVE CONSISTS

Leonard Perlmutter, Aurora, Colo., assignor to K.C. Southern Railway Company, Kansas City, Mo.

Filed Aug. 10, 1983, Ser. No. 521,915
Int. Cl.[4] G05D *13/66, 17/02;* **B60L** *15/38*
U.S. Cl. 364—426 **24 Claims**



13. In a fuel conserving control apparatus for a multiple unit locomotive consist having a lead locomotive, a plurality of trail locomotives, and throttle circuits for the locomotives all normally having the same condition as the throttle circuit of the lead locomotive to operate all locomotives at substantially the same power level in a manual mode of operation, the improvement comprising:

means for setting a set speed at which it is desired for the consist to operate;

means for sensing the actual speed of the consist;

means for operating the consist in a fuel save mode of opera-

tion in which the throttle circuits of the trail locomotives are adjusted automatically to sequentially increase or decrease the power levels of the locomotives in discrete increments to effect substantial conformity of the actual speed with the set speed;

means for establishing minimum and maximum speeds of the consist; and

means for confining the set speed to the range between said minimum and maximum speeds.

4,602,336

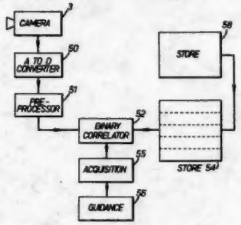
GUIDANCE SYSTEMS

George Brown, Benfleet, England, assignor to GEC Avionics Limited, Rochester, England

Filed May 16, 1983, Ser. No. 494,916

Int. Cl.[4] G06F *15/50*; G01S *13/89*

U.S. Cl. 364—456 **6 Claims**



1. A method of guiding a moving body to a predetermined location, comprising the steps of: storing data corresponding to a plurality of reference locations which are positioned generally along an expected approach path of a moving body, with at least some of said reference locatons being laterally displaced from said path, and with the extent of the lateral displacements reducing with decreasing distance from said predetermined location; causing the moving body to move toward said predetermined location; viewing the surroundings of the moving body along its path of movement by means of a viewing device having a field of view substantially larger than the effective area of each of said reference locations to provide output signals corresponding to said field of view; correlating the output signals corresponding to the field of view of the viewing device with said stored reference location data; and using the results of said correlation to guide the moving object to said desired location.

4,602,337

ANALOG SIGNAL TRANSLATING SYSTEM WITH AUTOMATIC FREQUENCY SELECTIVE SIGNAL GAIN ADJUSTMENT

James R. Cox, 1001 Copperfield Ct., Louisville, Ky. 40207

Filed Feb. 24, 1983, Ser. No. 469,287

Int. Cl.[4] G06F *15/20*; G06G *7/62*; H03G *5/00*; H04R *27/00*

U.S. Cl. 364—480 **5 Claims**

1. An analog signal translating system with automatic frequency selective signal gain adjustment comprising:

input means for supplying an input analog signal;

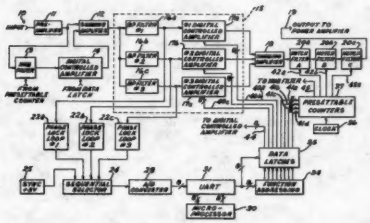
an analog signal processing channel coupled to said input means and having a predetermined combined bandwidth, the signal processing channel including a plurality of individual signal channels coupled in parallel to said input means, at least one of the individual signal channels having a bandpass filter and a digital controlled amplifier connected in series, the bandwidth of said individual channel being less than the combined bandwidth of the signal processing channel;

output circuit means coupled to the individual signal channels for supplying the combined bandwidth analog signal to an output utilization circuit;

means including a phase lock loop circuit coupled to said one individual signal channel for generating a substantially constant amplitude output signal indicative of the occurrence of a potential oscillation at a frequency within the band of said individual signal channel;

means for periodically sampling the output of said phase lock loop circuit and converting the amplitude of each sample to a digital multibit numeric value signal;

preprogrammed microprocessor means coupled to the sampling means to provide, in response to the occurrence of a predetermined number of said digital multibit numeric value signals of substantially constant value within a predetermined time period from the sampling means, a first output indicating the potential presence of an oscillation at a frequency within the bandwidth of said individual signal channel;



and means responsive to said first output of the microprocesor to attenuate the gain of the digital controlled amplifier in said individual channel by a predetermined amount so as to reduce the potential for oscillation at said frequency within said individual channel.

4,602,338

IMPEDANCE MEASUREMENT IN 4-WIRE TO 2-WIRE CONVERTERS

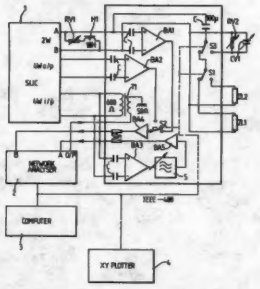
John W. Cook, Ipswich, England, assignor to British Telecommunications, London, England

Filed Sep. 1, 1983, Ser. No. 528,575

Claims priority, application United Kingdom, Sep. 2, 1982, 8224999

Int. Cl.[4] G01R *27/14*

U.S. Cl. 364—482 **20 Claims**



17. An apparatus for determining impedance parameters of a 4-wire to 2-wire converter comprising:

(a) means to generate an oscillating signal and apply said oscillating signal to input terminals of a 4-wire side of said converter, said means generating oscillating signals at a number of different frequencies;

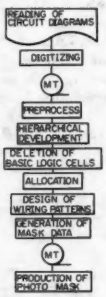
(b) a first known reference impedance;
(c) a second known reference impedance;
(d) comparator means to compare two oscillating signals and produce an output representative of the magnitude ratio of said two signals;
(e) means to feed said oscillating signal applied to said input terminals of said 4-wire side of said converter also to said comparator means;
(f) a variable impedance;
(g) switch means to connect one of said first, second known reference impedance, and said variable impedance, across 2-wire terminals of said converter, and also to connect one of said 2-wire terminals and the output terminals of said 4-wire side of said converter to said comparator means;
(h) means connected across said 2-wire terminals of said converter to provide a DC path between the two terminals to absorb the DC component of the output on the 2-wire side of said converter to ensure that said first and second reference impedances are de-coupled from any DC feed currents; and,
(i) a computer programmed to calculate said impedance parameters of said converter from said output of said comparator means and values of said first and second reference impedances on each of said number of frequencies, and to check that the output from said 4-wire side of said converter is below a predetermined threshold value when said variable impedance is connected across said 2-wire terminals.

4,602,339

METHOD OF MANUFACTURING MASTER-SLICE INTEGRATED CIRCUIT DEVICE

Satoshi Aihara, Sagamihara, and Tetsu Tanizawa, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 26, 1983, Ser. No. 535,832
Claims priority, application Japan, Sep. 30, 1982, 57-172167
Int. Cl.[4] H01L *27/02;* **G06F** *15/60*
U.S. Cl. 364—490 **2 Claims**



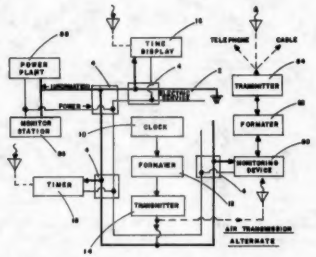
1. A method of manufacturing a master-slice integrated circuit device employing a total circuit diagram to produce mask patterns for forming the master-slice integrated circuit device, comprising the steps of:
(a) employing at least one logic block to produce mask patterns, the at least one logic block including a plurality of basic logic blocks each including circuit elements, and having output terminals;
(b) breaking down, in sequential order, each of the logic blocks included in the total circuit diagram into a plurality of basic logic blocks;
(c) reforming the total circuit diagram by deleting unused basic logic blocks, whose output terminals are not used, from the basic logic blocks in each of the logic blocks;
(d) deleting unused wirings and other unused basic logic blocks whose output terminals are not connected to any basic logic blocks as a result of the deletion of the basic logic blocks in said step c; and
(e) producing the mask patterns for forming the master-slice integrated circuit device in accordance with the total circuit diagram thus reformed, said step (e) comprising the substeps of:
(i) allocating the circuit elements of each of the basic logic blocks; and
(ii) producing the mask patterns by using mask data prepared from information regarding the allocation of the circuit elements of each of the basic logic blocks and on the wirings between the circuit elements.

4,602,340

INFORMATION DISTRIBUTION SYSTEM

Gustaf T. Appelberg, Fairfield, Conn., assignor to Research Activities, Incorporated, Fairfield, Conn.

Filed Sep. 29, 1982, Ser. No. 427,488
Int. Cl.[4] G05D *27/02;* **H04M** *11/00;* **H04B** *3/54*
U.S. Cl. 364—492 **8 Claims**



1. A system for distributing changing parameter information such as changing time, pressure, temperature, volume, velocity, density, flow, composition or like parameter information through a facility having an electrical gridwork with a plurality of outlets and a neutral or ground leg, comprising a source for generating coded electrical signals representative of changes in the parameter information, means at the facility for receiving the signals from the source and transmitting the signals in coded form through the facility on the leg as an antenna, and a plurality of signal employing means at the facility each connected to a respective one of the outlets and thereby coupled to the leg for receiving the same signals from the transmitting means representative of the same changes in the parameter information and carrying out same or different functions using said same signals.

4,602,341

SHARED DATA LOGGER CONTROLLER AND METHOD

Richard S. Gordon, Schenectady; Charles L. Devlin, Ballston Lake, and Mark W. Durling, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 16, 1983, Ser. No. 533,138
Int. Cl.[4] G06F *15/56*
U.S. Cl. 364—494 **11 Claims**

1. A method for channeling the flow of data from a plurality of turbine-generator data sources to a single data logger for printing a record of the data, each data source for generating a discrete burst of serially formated digital data representative of a respective operating condition of a turbine-generator, each discrete burst including at least one character, said data logger for printing the record in response to a single stream of serially formatted digital data including at least one character, which method comprises the steps of:
independently converting the serially formatted digital data from each of the plurality of turbine-generator data sources into respective parallelly formatted digital data;

assigning a respective predetermined priority to the serially formatted digital data from each data source;

storing the respective converted character so long as all converted characters from the respective serially formatted data having a higher priority have been stored, in a respective first data storage buffer having a respective first predetermined data storage capacity;

storing the respective converted character so long as all converted characters from the respective serially formatted data having a higher priority have been stored, in a respective second data storage buffer having a second predetermned data storage capacity, after the first predetermined data storage capacity of the respective first data storage buffer has been filled; and

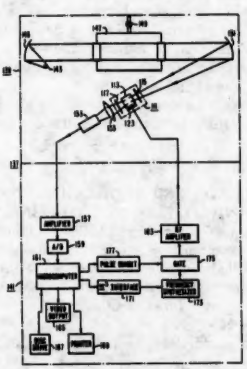
supplying the contents of a filled data storage buffer to said data logger to form at least part of the single stream of serially formatted digital data, so long as all converted characters have been stored.

4,602,342

ACOUSTO-OPTIC TUNABLE FILTER

Milton Gottlieb, Churchill, and Anselm Wachtel, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 4, 1983, Ser. No. 539,022
Int. Cl.[4] G02F *1/33, 1/11;* G02B *5/30*
U.S. Cl. 364—498 **10 Claims**



9. An acoustic-optic tunable filter comprising:

an input polarizer for selectively polarizing infrared radiation, an optically aligned mercurous chloride crystal acousto-optic tunable filter through which the selectively polarized infrared radiation is passed at a plane of incidence containing both the **(110)** and **(001)** crystal axes;

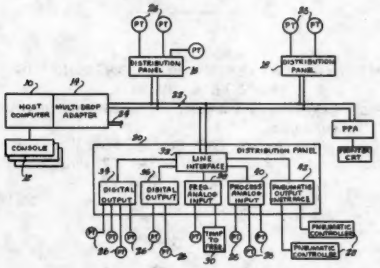
an acoustic transducer means coupled to a variable frequency rf energy source and to said mercurous chloride crystal to launch acoustic waves into said crystal in the plane of said crystal containing both the **(110)** and **(001)** axes and wherein the infrared radiation propagates through the mercurous chloride crystal at an angle equal to approximately ten degrees to the **(001)** crystallographic axis in order, said acoustic waves interacting with a selected narrow bandwidth portion of the polarized infrared radiation in order to make it distinguishable from the remaining infrared radiation, which selected narrow bandwidth portion if a function of the frequency of the rf energy and the acoustic waves.

4,602,343

SUPERVISORY AND CONTROL SYSTEM HAVING DYNAMIC SIGNIFICANT CHANGE OF VALUES

Roderick J. Dougherty, Oak Park, Ill., assignor to MCC Powers, Skokie, Ill.

Filed Mar. 19, 1982, Ser. No. 359,697
Int. Cl.[4] G06F *15/20;* G06G *7/68*
U.S. Cl. 364—505 **49 Claims**



30. A system having a data signal to be sampled comprising:

means for sampling at time intevals the value of the data signal,

means for determining a fixed discriminant value variable for each sampling time interval, responsive to successive time interval sampled values and a previous time interval transmitted information signal;

means for selectively transmitting an information signal responsive to the present time interval data signal exceeding the discriminant value.

4,602,344

METHOD AND SYSTEM FOR MEASUREMENT OF LIQUID LEVEL IN A TANK

Michael D. Ferretti, Nazareth; Brian L. Gabel, Northampton, and James A. Horton, Bethlehem, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 25, 1984, Ser. No. 664,817
Int. Cl.[4] G01F *23/00;* F15B *5/00*
U.S. Cl. 364—509 **14 Claims**

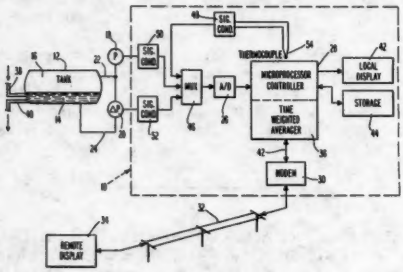
1. A method for measuring the level of substance in a tank in which the level is subject to changes and updating a prior collected average level of the substance comprising the steps of:

(a) continuously determining values of differential pressure from within the tank;

(b) determining the instantaneous level of substance within the tank in response to the determined values of differential pressure;

(c) determining a difference relationship between the prior collected average level and the instantaneous level;

(d) determining a relative weighting factor for the prior collected average level and the instantaneous level which weighting factor varies in accordance with the difference relationship;



(e) determining a new collected average in response to the relative weighting factor; and

(f) repeating steps b, c, d and e in which the new collected average becomes the prior collected average in step (c).

4,602,345

METHOD AND SYSTEM FOR CONTROLLING INDUSTRIAL ROBOT

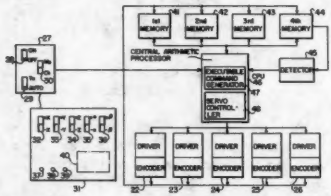
Shigeyoshi Yokoyama, Narashino, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,517

Claims priority, application Japan, Dec. 22, 1982, 57-223756

Int. Cl.[4] G06F *15/46*; G05B *19/42*

U.S. Cl. 364—513 **14 Claims**



1. A method of controlling a robot, comprising the steps of:

reading a model command for controlling movement of an objective of a robot, model reference points spatially correlative with positions defining operational positions of the objective and at least one transformed reference point which corresponding ones of said model reference points will have after translation of said model reference point by one of a plurality of command transformation programs for transforming said model command into an executable command;

providing an indication of the completion of said reading step;

determining the number of said transformed reference points;

selecting, in response to said indication, one of said plurality of said command transformation programs corresponding to said number of transformed reference points;

transforming said model command into an executable command using the one of said command transformation programs selected to provide for translation of said model reference point to said transformed reference point; and

operating the robot in response of said executable command.

4,602,346

METHOD AND APPARATUS FOR PROCESSING IMAGE DATA USING SUM AND SUBTRACT OPERATIONS

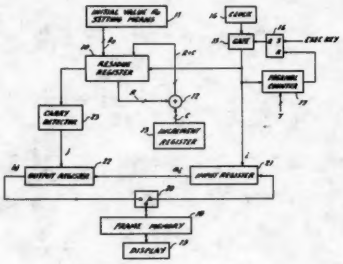
Katsura Kawakami, Yokohama; Shigeo Shimazaki, Kawasaki, and Etsuko Hirokami, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 18, 1984, Ser. No. 612,010

Claims priority, application Japan, May 19, 1983, 58-88527; May 19, 1983, 58-88531; Jun. 2, 1983, 58-98348; Jun. 10, 1983, 58-104444; Mar. 9, 1984, 59-45832

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—518 **18 Claims**



1. A method for processing image data by transposition between successively arranged first data points in a first image field and successively arranged second data points in a second image field, comprising the steps of:

(a) successively specifying a said first data point;

(b) summing first control data representing a residual value with second control data representing a constant value;

(c) (c_1) if the result of the summation does not exceed a predetermined value, updating said first control data with the result of the summation and specifying a said second data point corresponding to the specified first data point, and (c_2) if said result exceeds said predetermined value, subtracting same from the summation result to update said first control data with the residual value of the subtraction, and specifying a said second data point which is shifted by one data point with respect to the specified first data point;

(d) transferring said image data from the specified first data point to the specified second data point when said first image field is greater in dimension than said second image field, or transferring said image data from the specified second data point to the specified first data point when said first image field is smaller in dimension than said second image field; and

(e) repeating the steps (a) to (d) until all the second data points are filled with the image data.

4,602,347

MICROCOMPUTER ADDRESSING SYSTEM AND ELECTRONIC TIMEPIECE UTILIZING THE SAME

Hiroshi Koyama, Gunma, Japan, assignor to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed Aug. 20, 1982, Ser. No. 410,126

Claims priority, application Japan, Aug. 31, 1981, 56-137181

Int. Cl.[4] G06F *7/48*

U.S. Cl. 364—569 **4 Claims**

1. A memory addressing system for a microcomputer, comprising:

instruction data generating means for generating instruction data for designating operations of said microcomputer, including;

read only memory means having outputs for storing a program, and

instruction register means coupled to said read only memory means outputs for storing instruction data obtained from said read only memory means and providing said instruction data, said instruction data having a plurality of bits;

control means coupled to said instruction data generating means for executing said operations designated by said instruction data;

said control means comprising change signal generating means said change signal generating means including;

detecting gate means having an output, said detecting gate means being coupled to said instruction register means and responsive to said plurality of bits of said instruction data for providing a signal indicative thereof at said detecting gate means output when predetermined instruction data is received from said instruction data generating means;

logical state storing means coupled to said change signal generating means for storing a first logical state or a second logical state when said change signal is generated;

storage means having a multiplicity of one-bit memory cells connected to address signals for designating addresses, wherein a plurality of memory cells out of said multiplicity of memory cells are designated as one set by one of said address signals; and

address decoder means coupled to said instruction data generating means and said storage means for receiving address data included in said instruction data for instructing reading or writing of the data from or to said storage means and for providing said address signal to said storage means;

said address decoder means including logic means for generating a plurality of said address signals for one of said address data for selectively providing one of said plurality of address signals in accordance with the output from said logical state storing means and said logic means comprises a pair of logic gate means controlled responsive to the output signal from said logical state storing means, whereby one of said logic gate means is enabled to provide said address signal, wherein:

said logical state storing means comprises

flip-flop means, having an output, for storing said first logical state or said second logical state; and

inverter means, having an output, said inverter means being coupled to said output of said flip-flop means for inverting the polarity of a signal received therefrom and for providing said inverted signal at said output;

said output of said flip-flop means being coupled to one of said pair of logic gate means of said address decoder means and said output of said inverter being coupled to the other logic gate means.

4,602,348

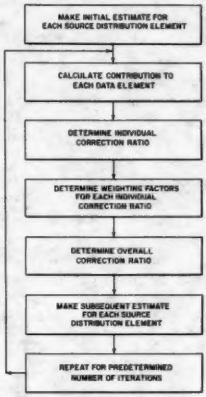
DECONVOLUTION METHOD AND APPARATUS

Hiram E. Hart, 3400 Wayne Ave., Bronx, N.Y. 10467

Filed Dec. 20, 1982, Ser. No. 450,914

Int. Cl.[4] G06F *15/31, 15/42*

U.S. Cl. 364—581 **2 Claims**


MAKE INITIAL ESTIMATE FOR EACH SOURCE DISTRIBUTION ELEMENT
CALCULATE CONTRIBUTION TO EACH DATA ELEMENT
DETERMINE INDIVIDUAL CORRECTION RATIO
DETERMINE WEIGHTING FACTORS FOR EACH INDIVIDUAL CORRECTION RATIO
DETERMINE OVERALL CORRECTION RATIO
MAKE SUBSEQUENT ESTIMATE FOR EACH SOURCE DISTRIBUTION ELEMENT
REPEAT FOR PREDETERMINED NUMBER OF ITERATIONS

2. A deconvolution apparatus for determining the source distribution elements of a source distribution using a plurality of measured data elements obtained by a measuring system having known response characteristics, comprising:

(a) means for making an initial estimate for each source distribution element from the measured data element;

(b) means for calculating a contribution to each data element from each previously estimated source distribution element;

(c) means for determining an individual correction ratio for each data element by dividing each respective measured data element by the sum of the calculated contributions to that data element;

(d) means for determining weighting factors for each individual corrections ratio as a function of each previously estimated source distribution element;

(e) means for determining an overall correction ratio for each source distribution element from the individual correction ratios and from the weighting factors;

(f) means for making a subsequent estimate for each source distribution element from the overall correction ratio; and

(g) means for repeating the operation of the aforementioned means for each subsequent estimate for a predetermined number of iterations, including means for determining, for each iteration, updated weighting factors and updated overall correction ratios, whereby the source distribution is reconstructed from the measured data elements.

4,602,349

DIGITAL POLARITY CORRELATOR

William S. Blackley, Edinburgh; Mervyn A. Jack, Lasswade, and James R. Jordan, Dunfermline, all of Scotland, assignors to National Research Development Corporation, London, England

Filed Jan. 11, 1984, Ser. No. 569,894

Claims priority, application United Kingdom, Jan. 12, 1983, 8300699; Mar. 11, 1983, 8306797

Int. Cl.[4] G06F *7/02, 11/00*

U.S. Cl. 364—728 **1 Claim**

1. A digital data processing apparatus for comparing two binary signals, the apparatus comprising:

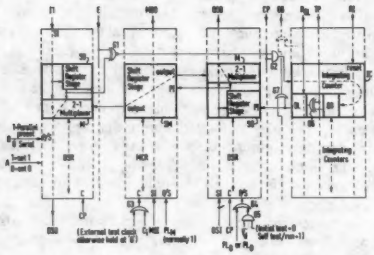
a first binary shift register comprising a first set of stages and a first connection means for connecting stages of said first set for operation in a first serial chain, said first connection

means including a first exclusion means for causing the exclusion from said first serial chain of any individually selected stage of said first set, and said first shift register having a serial input at one end of said chain for the application, in a normal running condition of the apparatus, of a first one of said binary signals;

an input line for the application in said normal running condition of the second of said binary signals;

a set of identical channels respectively corresponding to the stages of said first set, each of said channels comprising a respective comparator means for repeatedly effecting comparisons between the state of said input line and the state of the stage of said first set corresponding to that channel, each of said channels further comprising a respective counter means for counting the results of the comparisons effected by the comparator means of that channel, and each said counter means having a binary output whose state is dependent on whether or not the count has reached a given value;

a second binary shift register comprising a second set of stages and a second connection means for connecting stages of said second set for operation in a second serial chain, said second connection means including a second



exclusion means for causing the exclusion from said second serial chain of any individually selected stage of said second set, and the stages of said second set respectively corresponding to said channels and having respective parallel inputs;

means for utilising said parallel inputs selectively to load all said stages of said second set with binary digits respectively indicative of the states of the binary outputs of the counter means of the corresponding ones of said channels;

control means incorporating means for establishing said normal running condition, means for inhibiting said normal running condition for a limited period, and means for testing the operation of each of said channels during said period;

register means for storing information denoting which if any of said channels are found to be faulty by said testing; and

means for utilising the information stored by said register means to control the operation of said first exclusion means and said second exclusion means in said normal running condition to cause the exclusion from said first and second serial chains of those stages of said first and second sets corresponding to any of said channels found to be faulty by said testing.

4,602,350

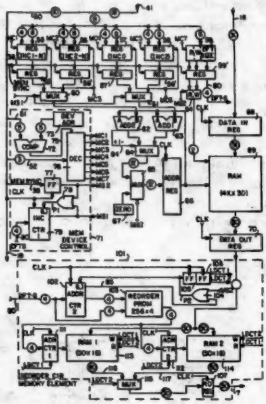
DATA REORDERING MEMORY FOR USE IN PRIME FACTOR TRANSFORM

Joseph H. Gray, Berkeley, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 706,222, Feb. 27, 1985, which is a continuation-in-part of Ser. No. 310,469, Oct. 13, 1981, abandoned. This application Sep. 16, 1985, Ser. No. 776,198

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—900 **5 Claims**



1. Apparatus for writing a set of N data values into memory and then reading the data values out of the memory so as to reorder the data values into N/N_i groups, each group consisting of N_i data values, where N is the product of a set of prime factors $N_1, N_2, \ldots N_L$, and N_i is one of said prime factors, comprising:

a memory having N storage locations for storing N data values, the storage locations being designated by addresses respectively numbered from 1 to N;

an address register for providing to the memory the address of a storage location to be accessed; and

an address selector circuit, for storing successive values of the address in the address register, comprising

a first register for storing a first increment, a second register for storing a second increment, a third register for storing a first quantity equal to the first increment minus N, a fourth register for storing a second quantity equal to the second increment minus N,

first adder means for adding the address in said address register to said first increment for $N_i - 1$ values in each group of N_i data values and for adding the address in said address register to said second increment on the remaining one of the N_i values in each group,

second adder means for adding the address in said address register to the first quantity for $N_1 - 1$ values in each group and for adding the address in said address register to the second quantity for the remaining one of the N_i values in each group,

means for selecting a starting address as the first address for said address register, and

means for storing in said address register as the next successive address the sum from either the second adder or the first adder, according to whether the sum from the second adder is positive or negative, respectively.

4,602,351

DEVICE FOR READING AND WRITING IC-EXTERNAL STORAGE CARDS

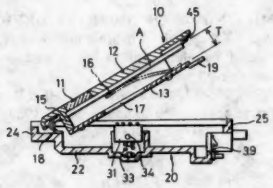
Norio Shimamura, and Taiji Sudo, both of Tokyo, Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,736

Claims priority, application Japan, Jul. 6, 1983, 58-122950; Jul. 6, 1983, 58-122951; Jul. 6, 1983, 58-122952; Jul. 18, 1983, 58-130493; Jul. 18, 1983, 58-130495; Aug. 4, 1983, 58-142807

Int. Cl.[4] G11C *17/00*; G06K *7/06*

U.S. Cl. 365—52 8 Claims



1. Device to be coupled with a computer for reading and writing IC external storage in the form of a card having a plurality of contact points arranged on a portion of the card comprising:

a first board having a main board and an additional board which are arranged to receive and hold the card therebetween,

a second board hingedly connected to the first board so that the first board is pivotally movable between a first position wherein the first board is engaged with the second board and a second position wherein the first board is opened with respect to the second board so that the storage card may freely be loaded on and removed from the first board.

a block member provided with contact pins of the number and arrangement corresponding to that of said contact points, mounting means mounting said block member on said second board, said mounting means comprising springs so as to normally maintain said block member in an extended position while being yieldable movable from said extended position,

said additional board having a window formed therein through which the contact pins on the block member pass so as to contact with the contact points of the loaded storage card when the first board is brought into the first position.

4,602,352

APPARATUS AND METHOD FOR DETECTION OF INFRARED RADIATION

Darryl D. Coon, Pittsburgh, Pa., and Gustav E. Derkits, Jr., New Providence, N.J., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Apr. 17, 1984, Ser. No. 601,230

Int. Cl.[4] G11C *11/42*

U.S. Cl. 365—114 38 Claims

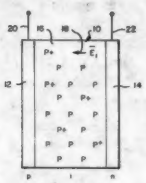
1. A method of detection of electromagnetic radiation comprising:

(a) storing of charge in localized states in a semiconductor;

(b) maintaining the temperature of said semiconductor sufficiently low to avoid appreciable thermal excitation of charge carriers out of said localized states;

(c) applying a first electric field to said localized states;

(d) exposing the semiconductor to electromagnetic radiation having sufficient energy to cause photoemission of charge from said localized states; and



(e) determining the extent of depletion of charge caused by said photoemission.

4,602,353

INTEGRATED SEMICONDUCTOR CIRCUIT WITH A DYNAMIC READ-WRITE MEMORY

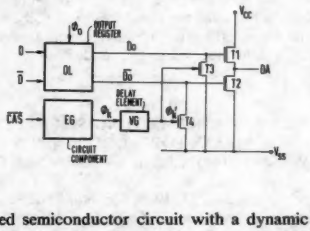
Jürgen Wawersig, and Dieter Kantz, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 554,432

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243496

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 21 Claims

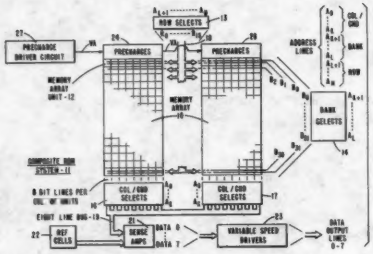


1. Integrated semiconductor circuit with a dynamic read-write memory having a memory matrix composed of identical memory cells having information contents addressable via row and column decoders with respect to the individual memory cells, column lines, and data output, the addressing of the individual matrix rows being initiated by a row address strobe while the addressing of the individual matrix columns is initiated by a column address strobe, the addressing being such that during read-out, simultaneously, the information contents of a plurality of the memory cells intended for data storage is processed, transmitted to and temporarily stored in an interim register, and including, in addition, a shift register exclusively operated by the column address strobe for the serial transmission of the information contents in the interim register, simultaneously obtained from the memory matrix, to the data output of the memory, comprising means for controlling the data output of the memory via the column address strobe so that the information present at the data output of the memory and made available by the shift register is preserved at the data output of the memory after termination of the column address strobe signal causing presence of the information contents at the data output for a defined time span.

4,602,354
X-AND-OR MEMORY ARRAY

Donald G. Craycraft, Spring Valley, and Giao N. Pham, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 10, 1983, Ser. No. 456,938
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—203 **16 Claims**

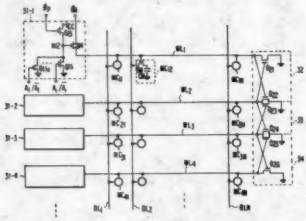


1. A read only memory, comprising:
a first multiplicity of memory stacks of serially arranged memory cells, commonly connected at the first ends to a first node;
means for selecting among said first multiplicity of memory stacks, connected to the second ends of said first memory stacks and a second node;
means for concurrently selecting said first and second nodes to determine the conductivity therebetween;
a second multiplicity of memory stacks of serially arranged memory cells, commonly connected at the first ends to a third node;
means for selecting among said second multiplicity of memory stacks, connected to the second ends of said second memory stacks and said second node; and
means for concurrently selecting said second and third nodes to determine the conductivity therebetween operable in the alternative with said means for concurrently selecting said first and second nodes.

4,602,355
MEMORY CIRCUIT WITH NOISE PREVENTING MEANS FOR WORD LINES

Hiroshi Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 12, 1983, Ser. No. 531,372
Claims priority, application Japan, Sep. 10, 1982, 57-157455
Int. Cl.[4] G11C *7/02*
U.S. Cl. 365—206 **11 Claims**

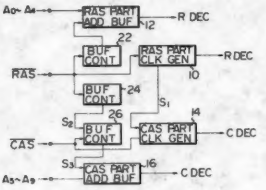


1. A memory circuit comprising first and second word lines adjacently arranged in parallel, a first driving means coupled to said first word line, a second driving means coupled to said second word line, a plurality of bit lines intersecting with said first and second word lines, a plurality of memory cells coupled between said word lines and said bit lines, and a noise preventing circuit coupled to said first and second word lines, said noise preventing circuit including a first field effect transistor coupled between said first word line and a reference voltage, means for connecting a gate of said first transistor to said second word line, a second field effect transistor coupled between said second word line and said reference voltage, and means for connecting a gate of said second transistor to said first word line.

4,602,356
SEMICONDUCTOR MEMORY DEVICE

Shigeki Nozaki, Kawasaki; Yoshihiro Takemae, and Seiji Enomoto, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 1, 1982, Ser. No. 445,921
Claims priority, application Japan, Dec. 2, 1981, 56-194200
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **6 Claims**



6. A semiconductor memory device, operatively connected to receive address signals and row and column address strobe signals, comprising:
a first buffer control circuit, operatively connected to receive the row address strobe signals, for producing address enable signals;
a second buffer control circuit, operatively connected in series with said first buffer control circuit and operatively connected to receive the column address strobe signals and the address enable signals;
a column address buffer, operatively connected in series with said second buffer control circuit, for receiving the address signals;
a third buffer control circuit operatively connected to receive the row address strobe signals;
a row address buffer, operatively connected to said third buffer circuit and operatively connected to receive the address signals;
a row address strobe part clock generator, operatively connected to receive the row address strobe signals, for providing a clock signal; and
a column address strobe part clock generator, operatively connected to said second buffer control circuit and said row address strobe part clock generator, for receiving the clock signal.

4,602,357
CODED ACOUSTIC ALARM TRANSMITTER/RECEIVER SYSTEM

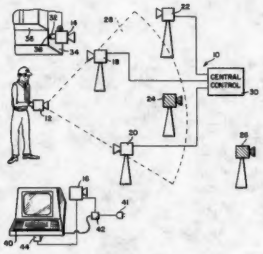
Ta-Lun Yang, Rockville, Md., and Paul Broome, Luray, Va., assignors to Ensco Inc., Springfield, Va.

Continuation-in-part of Ser. No. 348,245, Jul. 15, 1985, Pat. No. 4,473,821. This application Apr. 11, 1983, Ser. No. 483,907
Int. Cl.[4] G08B *19/00, 13/08, 13/14, 17/06*
U.S. Cl. 367—93 **11 Claims**

1. A personal acoustic alarm unit having means for providing an audible alarm signal in the audio range comprising a first transmitter means including a first signal generating means for simultaneously generating a plurality of individual sonic signals in the audio frequency range, each such audio range sonic signal having an audio frequency which differs from that of the

remaining audio range sonic signals, first code generator means connected to receive at least one of said individual audio range sonic signals and operating to apply a unique code thereto, and means for transmitting said audio range sonic signals simultaneously as an audible alarm signal; and

means for providing a silent alarm signal outside of the audio range comprising a second transmitter means including a second signal generating means for simultaneously producing a plurality of individual sonic signals in the inaudible frequency range, each such inaudible range sonic signal having an audio frequency that differs from that of the remaining inaudible range sonic signals, second code generating means connected to receive at least one of said individual inaudible range sonic signals and operating to apply a unique code thereto, and second means for transmitting said inaudible range sonic signals simultaneously as a silent alarm signal; and actuating means for initiating operation of said first and second signal generating means.



4,602,358

CAR STEREO SET

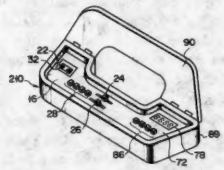
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 185,804, Sep. 10, 1980, Pat. No. 4,501,013. This application Aug. 13, 1984, Ser. No. 639,847

Claims priority, application Japan, Sep. 18, 1979, 54-119720; Sep. 18, 1979, 54-119721; Sep. 18, 1979, 54-119722; Sep. 18, 1979, 54-119724; Sep. 18, 1979, 54-119725; Sep. 18, 1979, 54-119726; Sep. 18, 1979, 54-119727; Sep. 18, 1979, 54-119728; Sep. 18, 1979, 54-119729; Sep. 18, 1979, 54-119730; Sep. 18, 1979, 54-119731; Sep. 18, 1979, 54-119732

Int. Cl.[4] G11B *33/02*

U.S. Cl. 369—12 **4 Claims**



1. In a tape recorder or an automobile having at least one armrest provided on an inside wall of a door of the automobile, the improvement comprising:

a tape recorder installed within said at least one armrest, said tape recorder comprising a portion having control members and a tape recorder mechanism having an operating portion including a cassette loading chamber, said control members and said operating portion being operable by a user while said tape recorder is in said at least one armrest;

said tape recorder including a swingable cover means at the upper surface of said armrest, and which is swingable between open and closed positions, for selectively covering at least said control members and said tape recorder mechanism to conceal them from the outside when said cover means is in said closed position;

said swingable cover means presenting a flat upper surface, free of projecting control members, at the upper surface of said armrest when said cover means is closed, said cover means permitting access to said control members and cassette loading chamber when in said open position, and said cover means forming an upper surface of said armrest when in said closed position.

4,602,359

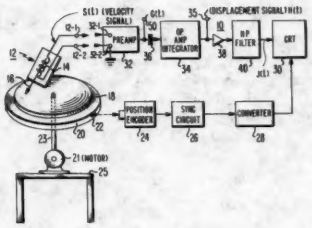
METHOD FOR DETERMINING VARIATIONS FROM FLATNESS IN THE TOPOGRAPHY OF A DISC SURFACE

Richard C. Palmer, Blawenburg, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 29, 1983, Ser. No. 518,733

Int. Cl.[4] G11B *27/36*

U.S. Cl. 369—58 **11 Claims**



1. A method for determining quantitatively variations from flatness in the topography of the surface of a video disc of the type used in high density information storage and retrieval systems, said disc having a spiral groove containing said information signals, comprising the steps of:

(a) rotating said disc at a constant prdetermined rotational velocity (ω) about an axis substantially perpendicular to the surface of the disc; and

(b) scanning the surface of said disc with an audio frequency pick-up cartridge having a stylus adapted to ride simultaneously over at least four adjacent turns of said groove of said disc to provide an electrical signal representing quantitatively vertical deviations in flatness of the surface from an average flatness level.

4,602,360

SOUND REPRODUCTION UNIT WITH MAGNETIC GOVERNOR

Anthony J. Porcelli, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed May 23, 1985, Ser. No. 737,116

Int. Cl.[4] G11B *19/28*

U.S. Cl. 369—63 **8 Claims**

1. In a sound reproducing mechanism having a mechanically operated turntable with record means for reproducing a sound

track thereon, the turntable being coupled for rotation with a governor mechanism comprising:

rotor means having slide rail means thereon, said rotor means having first and second rotor portions angularly displaceable relative to one another;

means interconnecting said first and second rotor portions for limiting angular displacement therebetween;

first and second magnet means positioned in attracting relation and slidably coupled to said slide rail means, said interconnecting means coacting with said magnet means to selectively limit radial displacement of said magnet means;

friction means on the outer extremities of said magnet means; and

cylindrical wall means in proximate relation to said rotor means for being engaged by said friction means upon rotation of said rotor means and radial displacement of said magnet means whereby to regulate the speed of rotation of said turntable.

4,602,361

APPARATUS FOR PLAYING BACK ROTATING RECORDING MEDIUMS

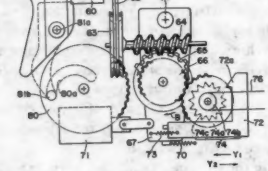
Takashi Kumaki, Sagamihara, and Takashi Saito, Ayase, both of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Jan. 17, 1984, Ser. No. 571,654

Claims priority, application Japan, Jan. 18, 1983, 58-4968[U]

Int. Cl.⁴ G11B *3/36, 17/04*

U.S. Cl. 369—77.2 **5 Claims**



1. An apparatus for playing back a rotating recording medium, comprising:

(a) a turntable for placing the rotating recording medium thereon;

(b) a signal pickup head for reproducing signals recorded on the rotating recording medium on said turntable;

(c) first means for moving said signal pickup head radially over and across the rotating recording medium on said turntable;

(d) second means movable selectively into an elevated position for supporting the rotating recording medium above said turntable and into a lowered position for placing the rotating recording medium on said turntable;

(e) a switching mechanism including a sole motor for selectively actuating said first and second means with said sole motor; and

(f) a locking mechanism responsive to operation of said switching mechanism for locking said first means against movement while said second means is being actuated by said switching mechanism, said first and second means including first and second driver gears, respectively, having respective parallel shafts and spaced from each other, said switching mechanism comprising a base, a switching arm pivotally mounted on said base, a worm gear assembly rotatably mounted on said switching arm and having a worm wheel and a third gear coaxially rotatable in unison therewith, said third gear being positioned between said first and second gears for selective meshing engagement therewith, a worm operatively connected to said motor and held in driving mesh with said worm wheeel, axes of said worm and worm wheel being generally perpendicular to each other, and a plunger operatively coupled to said switching arm for angularly moving the switching arm to move said worm wheel axially along said worm while in mesh therewith to thereby move said third gear into selective driving mesh with said first and second gears.

4,602,362

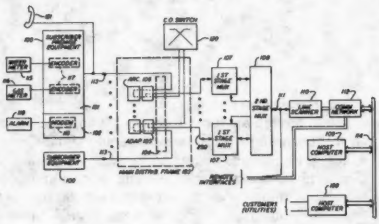
INFORMATION TRANSPORT SYSTEM

Franklin Hargrave; Francisco A. Middleton, both of Newtown, and Santanu Das, Shelton, all of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,527

Int. Cl.⁴ H04Q *11/00*; G08C *15/08, 15/12*

U.S. Cl. 370—54 **9 Claims**



1. An information transport system connecting equipment at the premises of a telephone subscriber with a service provider, said system comprising:

a plurality of first multiplexing means connected at a telephone company central office to subscriber telephone lines, the connection between each of said first multiplexing means and said telephone lines being made at a set of access points on a connector block of a main distribution frame at said central office, each said first multiplexing means including switches to said subscriber telephone lines for selecting a specific one of said subscriber lines, said switches permitting bidirectional communication between said first multiplexing means and said subscriber equipment;

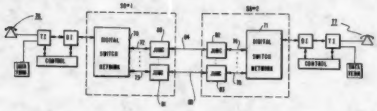
second multplexing means and a line scanner, said second multiplexing means coupling each of said first multiplexing means to said line scanner, said second multiplexing means including a set of multiplexing elements connecting with individual ones of said first multiplexing means, each of said second multiplexing elements having a modem for converting data signals of said subscriber equipment to a carrier modulated signal, each said second multiplexing element further including means, responsive to the hook condition of a telephone connected to a subscriber line, for activating said modem to transmit data between one of said first multiplexing means and said line scanner; and

each of said first multiplexing means and said second multiplexing means and said line scanner is of modular construction; said system further comprising communication links between said line scanner and said service provider, between said second multiplexing means and each of said first multiplexing means, and between said second multiplexing means and said line scanner to permit modular expansion of said system, said system being operable with a host computer of said service provider, said host computer storing data for use by said line scanner, and wherein said line scanner can limit access to a subscriber line in accordance with data stored in said host computer.

4,602,363
EXPANSION APPARATUS FOR USE IN COMMUNICATION SYSTEMS

Santanu Das, Shelton; Francisco A. Middleton, Sandy Hook, and Nicholas J. R. Carter, Shelton, all of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,094
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **16 Claims**



9. A method for connecting a first PBX switching system having a plurality of ports to a second PBX switching system having a plurality of ports in order to increase the overall line capacity of a switching system, comprising the steps of:

assigning a first series of code numbers to the ports of said first system and a different series of code numbers to the ports of said second system, wherein each code number is indicative of each port of said respective switching system;

connecting said first and second switching systems together via a first port of said first PBX system and a first port of said second PBX system by placing junctor circuits at said first ports, said junctor circuits each having a memory for storing therein a code number, and connecting said junctor circuits together to enable bidirectional communication between said first ports;

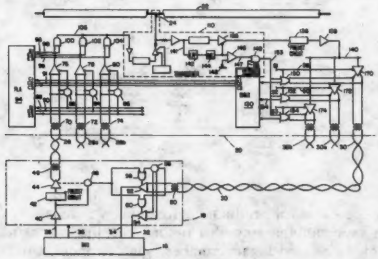
monitoring all code numbers generated by calling ports in each system to determine whether said numbers are associated with ports within the same system, and

connecting a calling port in said first system to said first port of said first system for any code number generated in said first system not associated with a port therein, whereby said junctor circuit of said first system stores said code number and transmits said code number to the junctor circuit of said second system for connection to a port in said second system having said code number.

4,602,364
LOCAL AREA DATA COMMUNICATION NETWORK

Alexander Herman, Sharon; Murray H. Bolt, Westwood, and Daniel C. Scavezze, Walpole, all of Mass., assignors to Codex Corporation, Mansfield, Mass.

Filed Apr. 23, 1984, Ser. No. 603,174
Int. Cl.[4] H04J *3/02*; H04Q *11/04*
U.S. Cl. 370—85 **13 Claims**



1. A data communication network over which data handling devices connected thereto can transmit and receive messages among themselves, comprising

bus means, and

a plurality of subnetworks, each subnetwork comprising

interface means for connecting a plurality of said devices to said subnetwork, and

concentrator means for connecting said interface means to said bus means,

said interface means and said concentrator means further comprising

transceiver means for transmitting, to said bus means and to devices connected to said subnetwork, messages originating from devices connected to said subnetwork, and for receiving from said bus means messages originating from other said subnetworks,

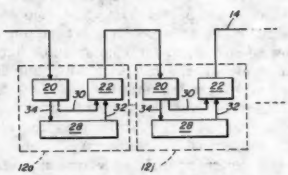
collision avoidance means for monitoring transmission attempts by said devices connected to said subnetwork, detecting competing such transmission attempts that would create a collision on said subnetwork, and, upon such detection, permitting a selected such attempt to enter said subnetwork while preventing other such attempts from entering said subnetwork, and

collision detection means for monitoring said bus means and preventing all said attempted transmissions from entering said bus means when a message from another said subnetwork is present on said bus means.

4,602,365
MULTI-TOKEN, MULTI-CHANNEL SINGLE BUS NETWORK

Robert J. White, Holliston, and Ross E. Roberts, Shrewsbury, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 10, 1984, Ser. No. 579,096
Int. Cl.[4] H04J *3/00, 3/16, 1/00, 3/02*
U.S. Cl. 370—89 **8 Claims**



1. In a token-passing ring network having a plurality of nodes connected to a single conductor bus loop, the improvement comprising, at each node,

a multiplexing means for connecting said node to said bus, said multiplexing means receiving from and transmitting to said bus on at least one of a plurality of channels, said channels operating simultaneously in parallel over said bus, each channel operating independently of each other channel and each channel having its own token.

4,602,366
SYSTEMS FOR CHANGING ADDRESSES OF TRANSMISSION APPARATUS

Kenta Takumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,731
Claims priority, application Japan, Jul. 18, 1983, 58-130672; Jul. 18, 1983, 58-130673
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—94 **6 Claims**

1. A transmission apparatus address changing system comprising:

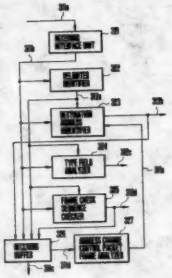
a common transmission line;

a plurality of transmitting apparatus connected to said common transmission line and each having a specified address; and

means for transmitting a packet frame having a destination

address field through said common transmission line from one to another transmitting apparatus;

each transmitting apparatus being provided with means for changing its own address when supplied with a control instruction from another transmitting apparatus, said means for changing its own address comprises a receiving interface unit connected to said transmission line, a delimiter identifier supplied with an output of said receiving interface unit for identifying start delimiter and an end delimiter of said packet frame for producing a delimiter identification signal, a destination address identifier for identifying a destination address frame of said packet frame a predetermined time after receipt of said delimiter identification signal, a type field analyzer supplied with the output of said receiving interface unit for analyzing a type field of said packet frame a predetermined time after receipt of said delimiter identification signal, a frame



check sequence checker supplied with a frame check sequence of said packet frame from said receiving interface unit for detecting error a predetermined time after receipt of said delimiter identification signal from said delimiter identifier, a receiving buffer supplied with outputs of said receiving interface unit, said destination address identifier, said delimiter identifier and said frame check sequence checker, and and address change control packet frame analyzer responsive to an output of said receiving buffer for applying an output to said destination address identifier;

means for transmitting an address changing control instruction frame to another transmission apparatus through said common transmission line, and

means for transmitting to said another transmitting apparatus another control instruction packet frame showing that its own address has been changed.

4,602,367

METHOD AND APPARATUS FOR FRAMING AND DEMULTIPLEXING MULTIPLEXED DIGITAL DATA

Thomas C. McDermott, III, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 27, 1984, Ser. No. 644,489
Int. Cl.[4] H04J *3/06*; H04L *7/00*
U.S. Cl. 370—106 **4 Claims**

1. Apparatus for demultiplexing multiplexed signals comprising, in combination:

first means for supplying a multiplexed signal comprising a plurality of data channels where each data channel includes framing information and an identity code embedded in the data of each of said data channels;

channel splitter second means, including output signal means and further including input means connected to said first means for receiving the multiplexed signal therefrom, for splitting the received signal into a plurality of data channels 1 to n;

signal switch third means, including apparatus signal output means, control signal input means and input means connected to said second means for receiving the data channels 1 to n therefrom, for routing signals between input and output in accordance with control signals supplied thereto; and

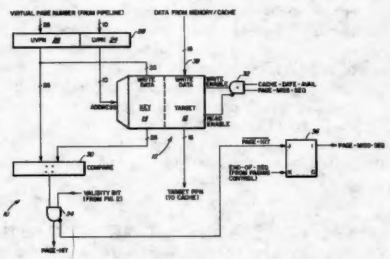
detection fourth means, connected between said output means of said second means and said control input means of said third means, for detecting the identity code of one of the data channels output by said second means and supplying a control signal to said third means to reroute the data therethrough in accordance therewith.

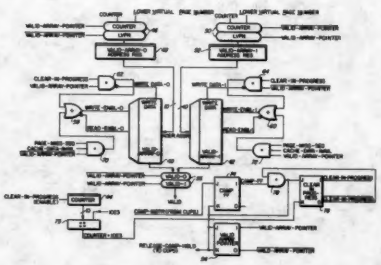
4,602,368

DUAL VALIDITY BIT ARRAYS

Joseph C. Circello, Phoenix; John E. Wilhite, Glendale; William A. Shelly, and Morgan S. Riley, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 15, 1983, Ser. No. 485,551
Int. Cl.[4] G06F *9/00*
U.S. Cl. 371—21 **11 Claims**





1. Apparatus for producing a first binary number of "n" bits from a second binary number of "m" bits, the lower order "a" bits of the second binary number being an index number and the higher order "b" bits of the second binary number being a key number, comprising:

an associative random access memory having 2^a addressable memory locations, said associative memory adapted to store b+n bits at each addressable memory location;

a first independently addressable validity bit array random access memory having 2^a addressable memory locations, said first array adapted to store a validity bit at each addressable memory location;

a second independently addressable validity bit array random access memory having a 2^a addressable memory locations, said second array adapted to store a validity bit at each addressable memory location;

pointer means for enabling only one of said validity bit arrays to receive address signals of "a" bits at a given time from the binary number m and to produce the validity bit stored at an addressed memory location;

circuit means for applying to the associative memory and to the enabled validity bit array the lower "a" bits of the second number as an address, said associative memory in response thereto and to a read enable signal for producing signals representing the (b+n) bits stored at the addressed location of the associative memory, and the enabled validity bit array in response thereto and to a read enable signal producing a signal representing the validity bit stored at the addressed location of the enabled validity bit array;

circuit means for comparing the signals representing higher order "b" bits of the second number and the "b" bits stored at the addressed location of the associative memory and for producing a signal that the "n" signals representing a first binary number produced by the associative memory is correct if the signals representing the higher order "b" bits of said second number and the "b" bits of the key number compare and the validity bit produced by the enabled validity bit array is set;

means for resetting all the validity bits of all addressable locations stored in the not enabled validity bit array; and

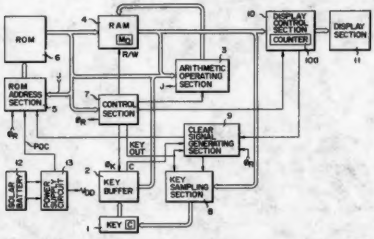
means responsive to a CAMP-instruction control signal for causing the pointer to disable the then enabled array and to enable the then disabled array after all validity bits of the not enabled validity bit array have been reset.

4,602,369

ELECTRONIC CALCULATOR CAPABLE OF CHECKING DATA IN A MEMORY UPON OPERATION OF A CLEAR KEY

Fumitune Murakami, and Katsumi Saito, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,509
Claims priority, application Japan, Apr. 20, 1983, 58-69562
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—25 **9 Claims**



1. An electronic calculator capable of checking data in a memory upon operation of a clear key, comprising:

key input means including at least a key for inputting operation data and a clear key for outputting a signal to designate clear processing;

memory means connected to said key input means for storing the data input by the operation of said key input means;

check data memory means for storing checked data to check a malfunction;

reference data generating means for outputting reference data to be compared with the checked data;

battery means for supplying power and generating a signal representative of a recovery toward normal battery voltage;

discriminating means, connected to both said check data memory means and said reference data generating means, for comparing the checked data with the reference data to see if the checked data has been changed due to a voltage drop in said battery means;

clear processing means, connected to said memory means, for clearing part of said memory means;

initialization processing means, connected to said memory means, for initializing said memory means;

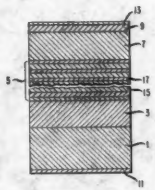
control means coupled to said battery means, said check data memory means, said clear processing means and said initialization processing means for writing the reference data generated from said reference data generating means into said check data memory means when power is supplied from said battery means, for receiving a discrimination result signal from said discriminating means when said clear key is operated, and for generating a control signal in response to the discrimination result signal to cause one of said clear processing means and initialization processing means to perform the associated process.

4,602,370

LARGE OPTICAL CAVITY LASER HAVING A PLURALITY OF ACTIVE LAYERS

Won-Tien Tsang, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 12, 1983, Ser. No. 493,792
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **10 Claims**



1. A semiconductor laser comprising a first cladding layer having a first conductivity type, a second cladding layer having a second conductivity type, and a large optical cavity, said large optical cavity being between said first cladding layer and said second cladding layer, said large optical cavity comprising a plurality of active layers having a first bandgap interleaved with a plurality of spacer layers having a second bandgap, said first bandgap being less than said second bandgap, said active layers having a thickness great enough so that quantum effects are not significant.

4,602,371
HIGH OUTPUT SEMICONDUCTOR LASER DEVICE UTILIZING A MESA-STRIPE OPTICAL CONFINEMENT REGION

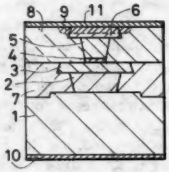
Toshihiro Kawano, Hachioji; Tsukuru Ohtoshi, Kokubunji; Naoki Chinone, Hachioji; Takashi Kajimura, and Michiharu Nakamura, both of Hinodemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,578

Claims priority, application Japan, Jan. 17, 1983, 58-4175; Feb. 9, 1983, 58-18830; Feb. 10, 1983, 58-19823

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—45 **24 Claims**



1. A semiconductor laser device comprising:

an optical confinement region comprising first, second, third and fourth semiconductor layers provided on the upper part of a predetermined semiconductor substrate in contact with each other successively, said first and fourth semiconductor layers being smaller in refractive index than said second and third semiconductor layers, said third semiconductor layer being larger in refractive index than said second semiconductor layer, said second and fourth semiconductor layers being larger in forbidden bandwidth than said third semiconductor layer, and at least said first and fourth semiconductor layers being opposite in conductivity type to each other, wherein said optical confinement region is formed into a mesa-stripe having a pair of side walls which are substantially parallel to the traveling direction of a laser beam, said side walls being embedded with a fifth semiconductor layer, said mesa-stripe being trapezoidal with a lower surface in contact with said substrate being larger than an upper surface opposite said lower surface, and wherein the width of said second semiconductor layer in a section perpendicular to the traveling direction of the laser beam and in the direction parallel to a junction within said optical confinement region is made larger than that of said third semiconductor layer at a surface of said second semiconductor layer interfacing with said third semiconductor layer;

a first electrode coupled to said substrate; and

a second electrode coupled to said fourth semiconductor layer.

4,602,372
GAS LASER GENERATOR

Kouji Sasaki; Hiroyuki Sugawara; Kouji Kuwabara, all of Hitachi; Toshiharu Shirakura, Ibaraki; Yukio Kawakubo, and Satoshi Takemori, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 549,823

Claims priority, application Japan, Nov. 10, 1982, 57-195912

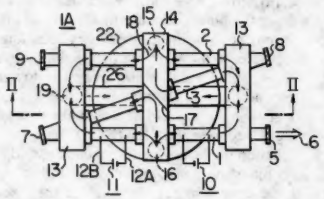
Int. Cl.[4] H01S 3/03

U.S. Cl. 372—58 **6 Claims**

1. A gas laser generator having a discharge tube structure comprising a plurality of discharge tubes connected in series, each having discharge sections in right and left portions, and provided with mirrors for resonating a laser beam, cooling ducts communicating with end sections and an intermediate section of said discharge tube structure, a centrifugal blower provided for said cooling ducts, and a mixture gas which circulates for cooling through said discharge tube structure and said cooling ducts, said cooling ducts comprising:

(A) end common vessels and an intermediate common vessel provided at both end sections and the intermediate section of said discharge tube structure and communicating said plurality of discharge tubes with one another;

(B) a first cooling duct which communicates with one of said end common vessels and intermediate common vessel, and



second cooling ducts which communicate with the other of said end common vessels and intermediate common vessel; and

(C) a centrifugal blower having a first communicating port communicating with said first cooling duct, and at least two second communicating ports communicating with said second cooling ducts, said two second communicating ports located symmetrically with respect to said first communicating port.

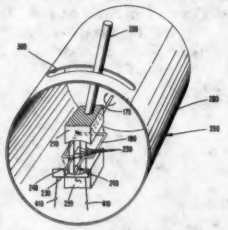
4,602,373
VARIABLE REACTIVE FORCE EXERCISE DEVICE

Walter Dorfman, Warminster, Pa., assignor to Roy S. Robinson, Levittown, Pa., a part interest

Filed Sep. 9, 1983, Ser. No. 530,692

Int. Cl.[4] A63B 21/24, 21/00

U.S. Cl. 272—129 **20 Claims**



20. A variable, reactive force, exercise device comprising:

an armature having a conductor which forms an open loop;

means for generating a magnetic field;

means for enabling an operator of said exercise device, through the exertion of physical force, to rotate said armature within said magnetic field to move said loop through a rotational path centered about said armature and thereby induce a current within said conductor;

an electrical load;

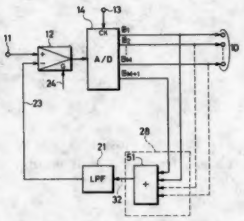
means for coupling said electrical load to said conductor to close said loop at a selective orientation of said loop in said rotational path relative to said magnetic field; and

means for varying the force required by said operator to rotate said armature, comprising means for varying said selective orientation of said loop relative to said magnetic field.

4,602,374
MULTI-LEVEL DECISION CIRCUIT

Yasuhisa Nakamura, Yokohama, and Yoichi Saito, Yokosuka, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,762
Claims priority, application Japan, Feb. 27, 1984, 59-37106; Oct. 15, 1984, 59-215879
Int. Cl.⁴ H03M *1/06, 1/12*
U.S. Cl. 375—17 **13 Claims**



1. A multi-level signal decision circuit comprising:

a DC level control means supplied with a multi-level amplitude signal of 2^M (M being an integer equal to or greater than 2) levels, for changing, by a DC level control signal, the DC level to be superimposed on the output multi-level amplitude signal;

an AD converter connected to the output side of said DC level control means, for converting its output multi-level amplitude signal into a digital signal of N (N being an integer greater than M) bits and providing its M high-order bits as a multi-level decided output to an output terminal;

a feedback signal generating means supplied with the output of at least an (M+1)th one of (M+1)th and less significant bits of the AD converter output and at least one of its M high-order bits, for generating a DC level control feedback signal; and

a low-pass filter for integrating the DC level control feedback signal from said feedback signal generating means and feeding it as the DC level control signal back to said DC level control means, each of said feedback signal generating means and said low-pass filter constituting a part of a feedback system.

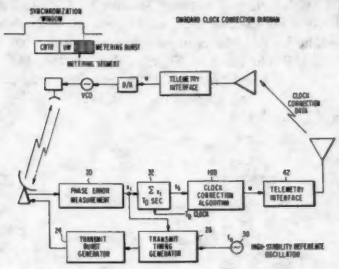
4,602,375
ONBOARD CLOCK CORRECTION BY MEANS OF DRIFT PREDICTION

Thomas Inukai, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jun. 11, 1982, Ser. No. 387,582
Int. Cl.⁴ H04B *7/185*
U.S. Cl. 375—109 **14 Claims**

8. A satellite clock system of the type comprising means for transmitting metering bursts to a satellite; means for determining an amount of phase error in an onboard clock of said satellite in response to re-transmitted bursts received from said satellite, and error correction means for generating and transmitting to said satellite an error correction value for correcting said error in said onboard clock relative to said metering bursts, the improvement characterized in that said error correction means comprises:

clock correction algorithm processing means for curve-fitting said determined phase errors according to a polynomial function having coefficients, said algorithm processing means adjusting the values of said coefficients in order to minimize an error between said determined phase errors and results of said polynomial function, determining a predicted clock drift in accordance with said polynomial

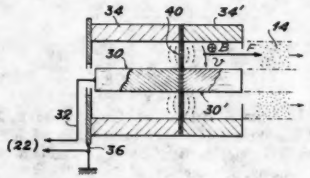


function and calculating said error correction value in accordance with said predicted clock drift.

4,602,376
SOFT X-RAY SOURCE WITH CYLINDRICAL PLASMA COMPRESSION

Henri J. Doucet, Les Molières; Michel Gazaix, Antony; Henri Lamain, Clamart; Claude Rouillé, Magny-les-Hameaux, and Jean-Pierre Furtlehner, Jouy-en-Josas, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Aug. 23, 1984, Ser. No. 643,457
Claims priority, application France, Sep. 2, 1983, 83 14085
Int. Cl.⁴ H01J *35/00;* H05G *1/00;* H05H *1/24*
U.S. Cl. 378—119 **6 Claims**



1. An intense soft X-ray source comprising a means for producing a cylindrical plasma jet between a cathode and an anode, connected to a pulsed high voltage generator, wherein the means for producing the plasma jet comprises:

a capacitor bank connected to a charging voltage source and also to a two conductor transmission line provided with a tripping means, the assembly having a very low inductance so as to permit a rapid discharge, said two conductors being coaxially arranged

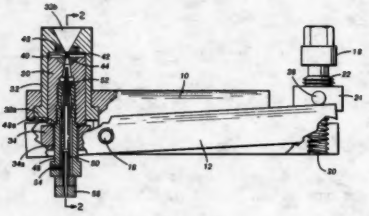
a sheet of solid material connected by its peripinery to one of the conductors of the line and by its central part to the other conductor, so that a radial discharge can be produced when the tripping means is conductive, a plasma jet resulting from the explosion of the sheet, and

means for giving the said plasma jet a cylindrical shape.

4,602,377
DIAMOND-ANVIL HIGH-PRESSURE CELL WITH IMPROVED X-RAY COLLIMATION SYSTEM

David Schiferl, Los Alamos; Barton W. Olinger, Santa Fe, and Robert W. Livingston, Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1984, Ser. No. 595,013
Int. Cl.[4] G21K *1/02*; G01N *23/20*
U.S. Cl. 378—150 **4 Claims**



1. In a diamond-anvil high-pressure cell having a tubular piston and a cylinder in which the piston is slidable to effect compression of a pair of opposed diamonds located between said piston and said cylinder, said piston including a central bore opening on one end, an adjustable X-ray collimation system comprising a tubular insert engageable in said bore of said piston, said insert including a central bore and having first and second ends, with said first end of said insert being closest to the said opposed diamonds and said second end of said insert extending out of the open end of said piston, a collimator insertable in said bore of said tubular insert, said collimator having a central bore and having first and second ends corresponding respectively with said first and second ends of said insert, elastomeric pivot means mounted in said bore of said insert at said first end of said insert for flexibly retaining said first end of said collimator while allowing said collimator to pivot within said pivot means, and adjustable locking means located at said second end of said insert for adjusting and securing said second end of said collimator so as to be in alignment with said opposed diamonds.

4,602,378
X-RAY TABLE

Arnold L. Kelman, Bridgeport, Conn.; John F. Prendergast, Franklin, Wis.; Edward P. Stevens, Brookfield, Wis., and George R. Lang, New Berlin, Wis., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 409,757, Aug. 19, 1982. This application Feb. 28, 1984, Ser. No. 582,481
Int. Cl.[4] A61B *6/00*; G03B *41/16*
U.S. Cl. 378—26 **15 Claims**

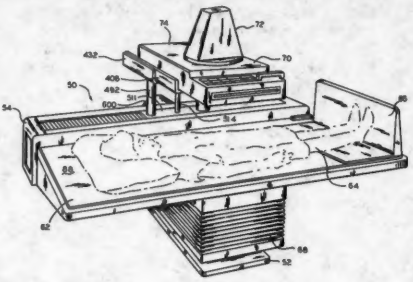
1. An X-ray table assembly, comprising:

a base;

a table frame supported by said base for titling about a horizontal and transverse pivot axis, said table frame including a patient support surface;

X-ray source means supported by said table assembly below said patient support surface and including drive means for translating said source means longitudinally and transversely with respect to said patient support surface;

X-ray detection means supported by said table assembly above said patient support surface and including drive means for translating said detection means longitudinally and transversely with respect to said patient support surface independently of said longitudinal and transverse translation of said X-ray source means; and

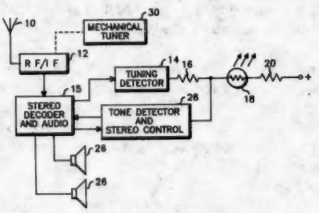


drive means for translating said X-ray detection means toward or away from said patient support surface.

4,602,379
DUAL INDICATOR CIRCUIT FOR TUNING AND STEREO SIGNALS

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1984, Ser. No. 605,711
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—12 **7 Claims**



1. A dual indicator for use in a stereophonic receiver and comprising:

a visual indicator circuit including a light-emitting diode wherein the brightness of the diode is a function of the applied current;

a source of current coupled to a first terminal of the diode;

current limiting means coupled to a second terminal of the diode;

tuning detector means coupled to a first portion of the receiver for detecting tuning status and for allowing current flow through the current limiting means only when the tuning detector means detects that a station is properly tuned in; and

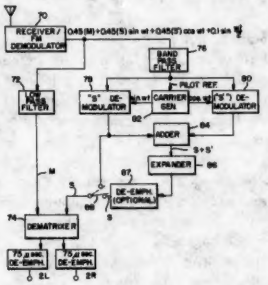
stereo presence tone detector means coupled to a second portion of the receiver for detecting the presence of stereophonic signals in the received signals by detection of a stereo presence tone, and coupled to the second terminal of said diode for allowing additional current flow through the diode when stereophonic signals are present.

4,602,380

COMPATIBLE TRANSMISSION TECHNIQUES FOR FM STEREOPHONIC RADIO AND TELEVISION

David W. Stebbings, Ridgefield, Conn., assignor to CBS Inc., New York, N.Y.

Filed Jan. 4, 1985, Ser. No. 688,940
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—13 17 Claims



1. A method for extending the range and for increasing the channel capacity of an FM stereophonic radio broadcast system as compared to the conventional two-channel FM stereophonic system while maintaining compatibility with conventional monophonic and two-channel receivers, comprising the steps of:

transmitting sum (M) and difference (S) signals respectively corresponding to the sum of left and right channel stereophonic signals and to the difference between the left and right channel stereophonic signals, and a compressed difference signal (S') which contains substantially the same information as said difference signal (S) and is compressed according to a desired compression law,

receiving said sum signal M, said difference signal S and said compressed difference signal S',

combining the received difference signal S with the received compressed difference signal S' and expanding the combined signal to obtain a noise-reduced difference signal having an amplitude level substantially equal to that of the received difference signal S, and

de-matrixing the received sum signal M with the noise-reduced difference signal to obtain said left and right channel stereophonic signals.

4,602,381

ADAPTIVE EXPANDERS FOR FM STEREOPHONIC BROADCASTING SYSTEM UTILIZING COMPANDING OF DIFFERENCE SIGNAL

Aldo G. Cugnini, Tarrytown, N.Y.; Daniel W. Gravereaux, New Canaan, and David W. Stebbings, Ridgefield, both of Conn., assignors to CBS Inc., New York, N.Y.

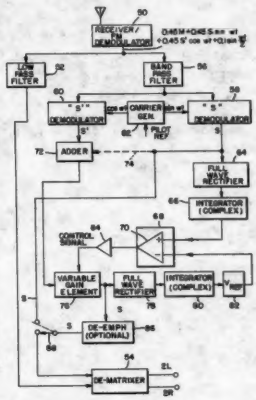
Filed Jan. 4, 1985, Ser. No. 688,854
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—13 12 Claims

1. An adaptive expander for use in the receiver of a biphonic FM stereophonic broadcasting system which is adapted to receive a stereo difference signal S and a compressed version S' of said stereo difference signal, said expander comprising:

an electronically controllable variable gain device having input, output and control terminals,

means for applying said compressed difference signal S' to the input terminal of said variable gain device, and

control signal generating means for generating a control signal responsively to both said compressed difference signal S' and said difference signal S and applying the control signal to the control terminal of said variable gain device for causing the gain between the input and output of the variable gain device to have a value dependent on the value of said control signal.

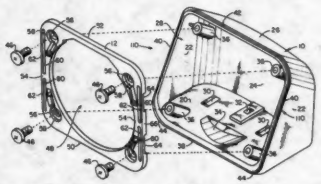


4,602,382

ELECTRO-ACOUSTIC TRANSDUCER ASSEMBLY

Moses A. Gabbay, Chestnut Hill, and Sang O. Oum, Wilmington, both of Mass., assignors to Boston Acoustics, Inc., Peabody, Mass.

Filed Oct. 26, 1984, Ser. No. 665,297
Int. Cl.[4] H04R 1/02
U.S. Cl. 381—90 12 Claims



1. In an electro-acoustic transducer assembly including a permanent magnet and a diaphragm having a voice coil bonded thereto, said assembly comprising, in combination:

a hollow casing having an opening formed in one surface thereof;

closure means for covering said opening and comprising an aperture therein in which said diaphragm is mounted, cover means mounted on one side of said closure means for protecting said diaphragm, and means for positioning said magnet on the opposite side of said closure means in proximity to said voice coil on said diaphragm;

latching means for releasably securing said closure means across said opening in said casing in a latched position with said cover means being positioned to the exterior of said assembly and said magnet being positioned in said casing, said latching means being operable by application of pressure at preselected locations on the periphery of said casing to release said closure means from said latched position; and

means for elastically biasing said closure means away from said opening of said casing upon release of said closure

means from said latched position, upon application of said pressure.

4,602,383

IMAGE DATA COMPRESSION SYSTEM

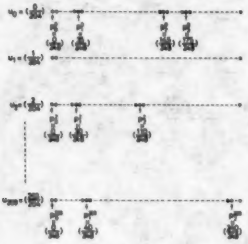
Katsuhiko Ogawa, Yokohama, and Shinju Horiguchi, Yokosuka, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed May 1, 1984, Ser. No. 606,074

Claims priority, application Japan, May 7, 1983, 58-79619; Jan. 28, 1984, 59-14092

Int. Cl.[4] G06K 9/36

U.S. Cl. 382—56 18 Claims



1. An image data compression system for encoding into a compressed code an image signal obtained by main and subscannings of an image, comprising:

line position detecting means for detecting a main-scanned line position from the image signal;

line position normalizing means for normalizing the line position detected by the line position detecting means;

relative normalized line position calculating means for obtaining relative normalized line position of the line to be coded relative to an immediately preceding coded line position;

relative normalized line position encoding means for encoding the relative normalized line positions calculated by the relative normalized line position calculating means;

run position detecting means for detecting a run position where a pel value changes on one main scan line of the image signal;

run position normalizing means for normalizing the run position detected by the run position detecting means;

relative normalized run position calculating means for obtaining relative normalized run positions for adjacent run positions in the image signal;

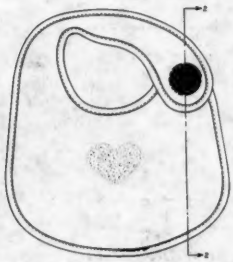
relative normalized run position encoding means for encoding the relative normalized run positions calculated by the relative normalized run position calculating means; and

synthesizing means for combining for each main scan line, the relative normalized line position code encoded by the relative normalized line position encoding means and the relative normalized run position codes encoded by the relative normalized run position encoding means.

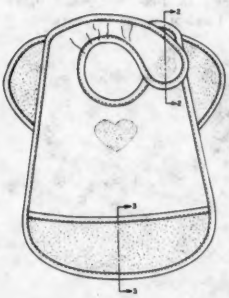
DESIGNS

JULY 22, 1986

284,708
BIB
Karen D. Marconi, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,263
Term of patent 14 years
U.S. Cl. D2—227

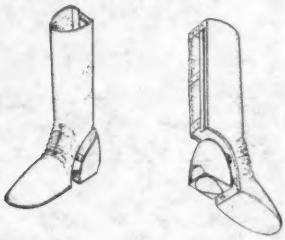


284,709
BIB WITH ROUNDED ARMS
Karen D. Marconi, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,415
Term of patent 14 years
U.S. Cl. D2—227

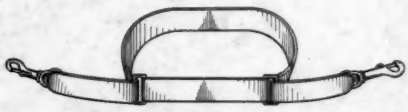


284,710
COMBINED SWEATBAND AND EYESHIELD
Robert A. Hatchman, 1410 8th Ave., Arcadia, Calif. 91006
Filed Jan. 20, 1984, Ser. No. 572,647
Term of patent 14 years
U.S. Cl. D2—241

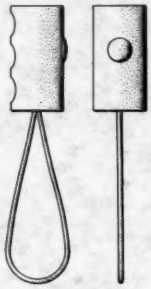
284,711
PROTECTIVE FIGHTING BOOT
James D. Bottoms, Rte. 7, Box 47-A, McKinny, Tex. 75069
Filed Feb. 21, 1984, Ser. No. 582,020
Term of patent 14 years
U.S. Cl. D2—271



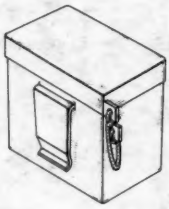
284,712
SEAT BELT FOR GROCERY SHOPPING CART
Mary J. Loftin, 3563 Peakwood Dr., SW., Roanoke, Va. 24014
Filed Jul. 25, 1983, Ser. No. 517,164
Term of patent 14 years
U.S. Cl. D2—380



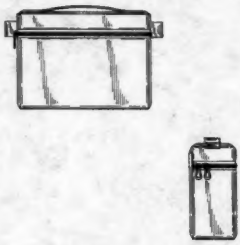
284,713
UMBRELLA HANDLE
Barry Brinker, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Filed Oct. 18, 1985, Ser. No. 788,957
Term of patent 14 years
U.S. Cl. D3—12



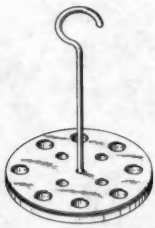
284,714
AMMUNITION BOX
Gary Thor, 132 Tennessee, Vallejo, Calif. 94590
Filed Jan. 6, 1984, Ser. No. 568,930
Term of patent 14 years
U.S. Cl. D3—38



284,715
REMOVABLE COOLER FOR A BACKPACK OR SIMILAR ARTICLE
Jeffrey M. Jacober, South Kingston, and Martha C. Hall, Providence, both of R.I., assignors to Sport Graphics, Inc., Cranston, R.I.
Filed Jan. 26, 1984, Ser. No. 574,025
Term of patent 14 years
U.S. Cl. D3—71



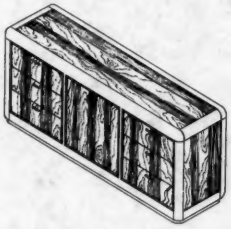
284,716
STOCKING HOLDER
John R. Honermann, P.O. Box 20502, Bloomington, Minn. 55420
Filed Apr. 1, 1983, Ser. No. 481,319
Term of patent 14 years
U.S. Cl. D6—315



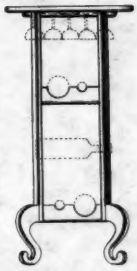
284,717
FOOTSTOOL
Edsel E. Murry, Senatobia, Miss., assignor to Samsonite Corporation, Denver, Colo.
Filed Feb. 13, 1984, Ser. No. 579,744
Term of patent 14 years
U.S. Cl. D6—349

284,718
ARM CHAIR
Henry Massonnet, Nurieux, France (01760)
Filed Jan. 20, 1984, Ser. No. 572,475
Claims priority, application France, Jul. 20, 1983, 832730
Term of patent 14 years
U.S. Cl. D6—375

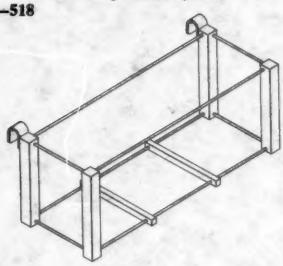
284,719
TRIPLE DRESSER
Huey T. Keller, High Point, N.C., assignor to Bernhardt Industries, Inc., Lenoir, N.C.
Filed Oct. 17, 1983, Ser. No. 542,783
Term of patent 14 years
U.S. Cl. D6—446



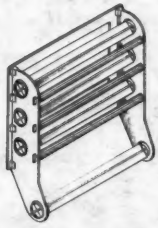
284,720
WINE RACK TABLE OR SIMILAR ARTICLE
Michael J. Watson, 918 East St. Vrain, Colorado Springs, Colo. 80903
Filed Dec. 12, 1983, Ser. No. 560,544
Term of patent 14 years
U.S. Cl. D6—488



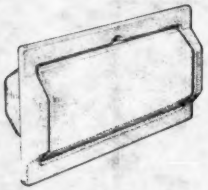
284,721
TISSUE BOX HOLDER
Clyde L. Carter, 1021 - 7th St. West, Birmingham, Ala. 35204
Filed Nov. 30, 1983, Ser. No. 556,344
Term of patent 14 years
U.S. Cl. D6—518

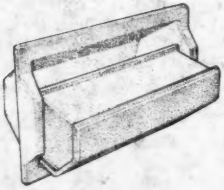


284,722
DISPENSER FOR METAL FOIL, PAPER OR THE LIKE
Zvi Beckerman, 6919 Lakeview La., Doraville, Ga. 30340
Filed May 9, 1984, Ser. No. 608,492
Term of patent 14 years
U.S. Cl. D6—520

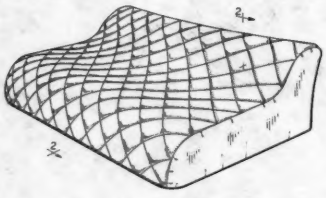


284,723
TIP-OUT WALL CONSOLE
Robert T. Morris, Bristol, and Robert J. Morris, Middlebury, both of Ind., assignors to Medallion Plastics, Inc., Middlebury, Ind.
Filed Oct. 19, 1983, Ser. No. 543,179
Term of patent 14 years
U.S. Cl. D6—560





284,724
NECK SUPPORT REST
Robert F. Clark, 180 George St., Rockwood, Ontario, Canada (N0B 2K0), and Hugh A. Smythe, 2 Heathbridge Park Rd., Toronto, Ontario, Canada M4G 2Y6
Filed Apr. 29, 1983, Ser. No. 490,240
Term of patent 14 years
U.S. Cl. D6—596



284,725
INVALID CUSHION
Joan Stuckey, 166 Burns Rd., Turramurra, New South Wales, 2074, Australia
Filed Jun. 14, 1983, Ser. No. 504,269
Claims priority, application Australia, May 6, 1983, 3723/83
Term of patent 14 years
U.S. Cl. D6—604

284,726
MUG
Mel Appel, Livingston, N.J., assignor to The Mel Appel Company, Short Hills, N.J.
Filed Nov. 23, 1983, Ser. No. 554,590
Term of patent 14 years
U.S. Cl. D7—5

284,727

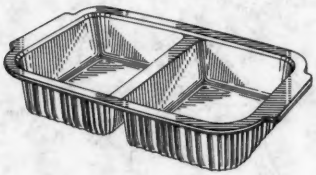
COMPARTMENTED OVENWARE DISH

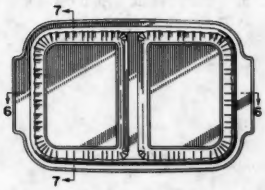
William C. Gerber, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Oct. 20, 1983, Ser. No. 543,863

Term of patent 14 years

U.S. Cl. D7—21





284,728

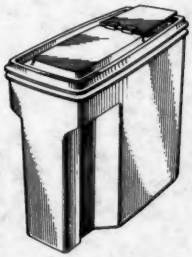
CEREAL CONTAINER

Jody A. Trivison, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jul. 15, 1983, Ser. No. 513,855

Term of patent 14 years

U.S. Cl. D7—79



284,729

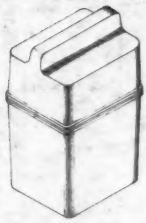
CANNISTER

John R. Hensley, Los Altos, and Frederick H. Stengel, Redwood City, both of Calif., assignors to Hensley Housewares, Los Altos, Calif.

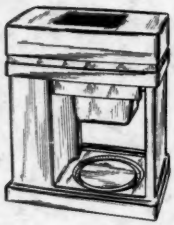
Filed Sep. 21, 1983, Ser. No. 534,381

Term of patent 14 years

U.S. Cl. D7—79

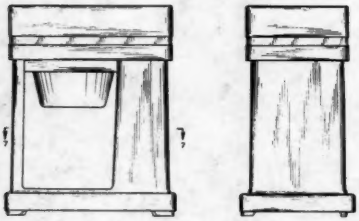


284,730
COFFEE BREWER
Vincent G. Marotta, 18801 S. Park Blvd., Shaker Heights, Ohio 44122
Filed Apr. 6, 1984, Ser. No. 597,271
Term of patent 14 years
U.S. Cl. D7—309

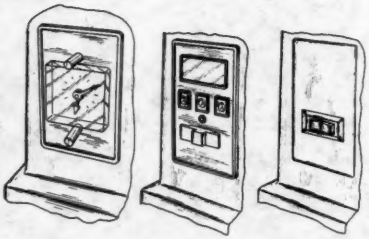


284,731
PRUNING-SHEARS
Erkki O. Linden, Billnäs, Finland, assignor to OY Fiskars AB, Helsinki, Finland
Filed Jun. 14, 1983, Ser. No. 504,227
Claims priority, application Finland, Dec. 16, 1982, 1114/82
Term of patent 14 years
U.S. Cl. D8—5

284,732
SHOVEL
Masaki Hozumi, Hyogo, Japan, assignor to Fujikogyo Co., Ltd., Hyogo, Japan
Filed Mar. 15, 1984, Ser. No. 590,421
Claims priority, application Japan, Sep. 30, 1983, 58-042756
Term of patent 14 years
U.S. Cl. D8—10

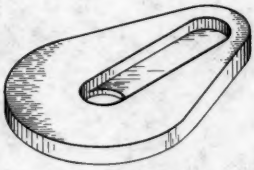


284,733
SHOVEL
Masaki Hozumi, Hyogo, Japan, assignor to Fujikogyo Co., Ltd., Hyogo, Japan
Filed Mar. 15, 1984, Ser. No. 589,958
Claims priority, application Japan, Sep. 30, 1983, 58-42757
Term of patent 14 years
U.S. Cl. D8—10

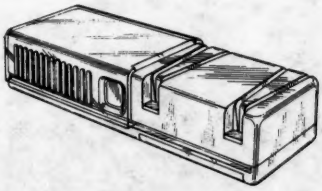


284,734
CRIMPING TOOL
Oryst P. Kurylo, Barberton, and Martin C. Ignasiak, Painesville Township, Lake County, both of Ohio, assignors to A P Products Incorporated, Mentor, Ohio
Filed Dec. 12, 1983, Ser. No. 560,754
Term of patent 14 years
U.S. Cl. D8—52

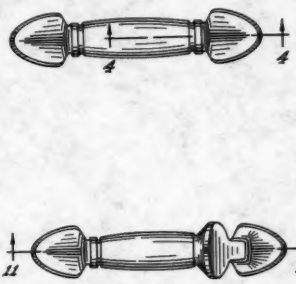
284,735
ROUTER SUB BASE
Larry E. Olson, 1149 - 129th Ave. N.E., Blaine, Minn. 55434, and Eugene T. Olson, 1250 - 135th Ave. N.E., Anoka, Minn. 55303
Filed Sep. 6, 1983, Ser. No. 529,359
Term of patent 14 years
U.S. Cl. D8—61



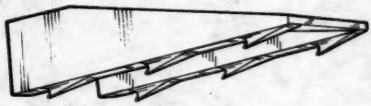
284,736
BATTERY OPERATED KNIFE SHARPENER
Sigeru Kawai, Higasimurayama, and Masaru Komiya, Higasiyamato, both of Japan, assignors to Kyusyu Hitachi Maxell, Ltd., Fukuoka, Japan
Filed Jan. 21, 1983, Ser. No. 459,958
Claims priority, application Japan, Jul. 22, 1982, 58-33557
Term of patent 14 years
U.S. Cl. D8—93



284,737
PULL
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Feb. 13, 1984, Ser. No. 579,422
Term of patent 14 years
U.S. Cl. D8—317

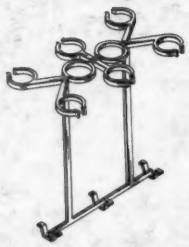


284,738
WEDGE LOCK FOR A SLIDING PANEL
Isaac Stone, 7888 Ostrow St., San Diego, Calif. 92111
Filed Apr. 21, 1983, Ser. No. 487,037
Term of patent 14 years
U.S. Cl. D8—402



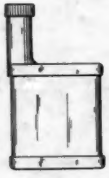
284,739
BOTTLE
Francois Thieffry, Meigneux, France, assignor to Societe D'Etudes de Chimie et de Therapie Appliquees Laboratoires de Cometologie Ives Rocher, La Gacilly, France
Filed Jun. 6, 1983, Ser. No. 501,707
Claims priority, application France, Dec. 30, 1982, 824 600
Term of patent 14 years
U.S. Cl. D9—336

284,740
CARRIER FOR BOTTLES
Thomas W. Steiger, Pompano Beach, Fla., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Feb. 3, 1984, Ser. No. 576,822
Term of patent 14 years
U.S. Cl. D9—344

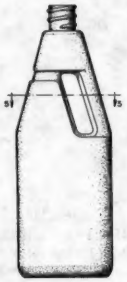


284,741
BOTTLE
Albert C. G. Poore, New Malden, and Bernard Sams, London, both of England, assignors to Sterling Drug Inc., New York, N.Y.
Filed Mar. 2, 1984, Ser. No. 585,594
Claims priority, application United Kingdom, Oct. 8, 1983, 1015577
Term of patent 14 years
U.S. Cl. D9—367

284,742
CONTAINER FOR FLUIDS
Rao K. Murukurthy, 9311 Osceola Ave., Morton Grove, Ill. 60053
Filed Aug. 4, 1983, Ser. No. 520,180
Term of patent 14 years
U.S. Cl. D9—375

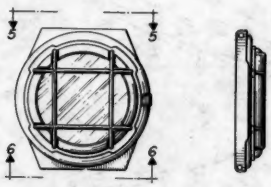


284,743
BOTTLE
Albert C. G. Poore, New Malden, and Bernard Sams, London, both of England, assignors to Sterling Drug Inc., New York, N.Y.
Filed Mar. 2, 1984, Ser. No. 585,593
Claims priority, application United Kingdom, Oct. 8, 1983, 1015576
Term of patent 14 years
U.S. Cl. D9—378

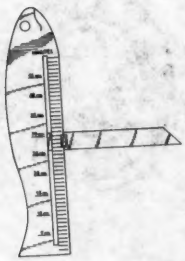


284,744
WATCH CASE
Franco Torrini, Florence, Italy, assignor to Torrini G. S.p.A., Florence, Italy
Filed Jun. 7, 1982, Ser. No. 386,029
Claims priority, application Italy, Dec. 9, 1981, 11898/81[U]
Term of patent 14 years
U.S. Cl. D10—33

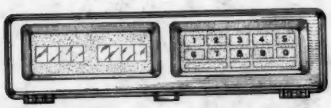
284,745
WATCH CASE
Aaron Minkowitz, 576-5th Ave., Suite 201, New York, N.Y. 10036
Filed Feb. 17, 1984, Ser. No. 581,437
Term of patent 14 years
U.S. Cl. D10—38



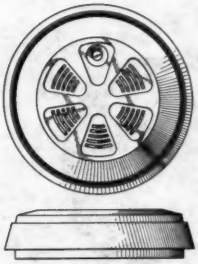
284,746
FISH COOKING TIMER INDICATOR
Robert Koval, 867 Liberty N.E., Salem, Oreg. 97301
Filed Apr. 11, 1983, Ser. No. 483,558
Term of patent 14 years
U.S. Cl. D10—64



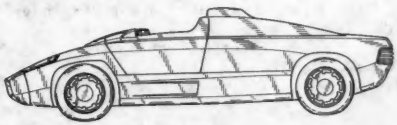
284,747
DWELL/TACHOMETER HOUSING OR SIMILAR ARTICLE
Donald W. Doman, Janesville, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.
Filed Feb. 9, 1984, Ser. No. 578,748
Term of patent 14 years
U.S. Cl. D10—98

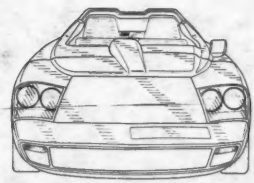


284,748
SMOKE DETECTOR
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Mar. 9, 1984, Ser. No. 587,946
Term of patent 14 years
U.S. Cl. D10—106



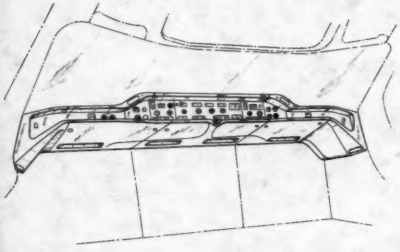
284,749
MOTORCAR
Eberhard Schultz, Amselweg 10, 7250 Warmbronn, Fed. Rep. of Germany
Filed Jul. 6, 1983, Ser. No. 511,241
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, MR502
Term of patent 14 years
U.S. Cl. D12—92



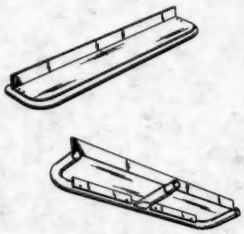


284,750
AUTOMOBILE TIRE
Misao Kawabata, Saitama, and Koujiro Yamaguchi, Tokyo, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Dec. 15, 1983, Ser. No. 561,704
Claims priority, application Japan, Aug. 25, 1983, 58-36756
Term of patent 14 years
U.S. Cl. D12—147

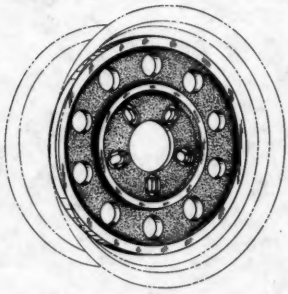
284,751
FRONT FACE OF AN INSTRUMENT PANEL FOR AN AIRPLANE
Richard W. Soederberg, Mühlacker, Fed. Rep. of Germany, assignor to Porsche Aktiengesellschaft, Fed. Rep. of Germany
Filed Aug. 17, 1983, Ser. No. 523,888
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 5615
Term of patent 14 years
U.S. Cl. D12—192



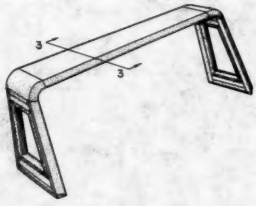
284,752
VEHICULAR RUNNING BOARD
Clifford L. Horton, Jr., 20732 Hunter La., Huntington Beach, Calif. 92646
Filed Jan. 3, 1984, Ser. No. 567,495
Term of patent 14 years
U.S. Cl. D12—203



284,753
VEHICLE WHEEL CENTER
Raymond J. Hedlund, Concord, Calif., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Oct. 28, 1981, Ser. No. 315,829
Term of patent 14 years
U.S. Cl. D12—210

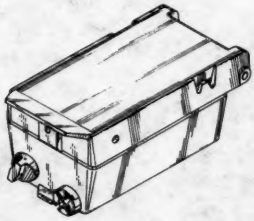


284,754
ARCHED RADAR SUPPORT FOR BOATS AND VEHICLES
John E. Shields, 13200 Casa Linda La., Garden Grove, Calif. 92644
Filed Apr. 25, 1983, Ser. No. 488,417
Term of patent 14 years
U.S. Cl. D12—317



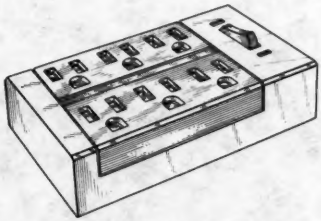
284,755
BATTERY CONTAINER
Roy E. Hennen, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.
Filed Jul. 5, 1983, Ser. No. 510,733
Term of patent 14 years
U.S. Cl. D13—9

284,756
CABLE CONNECTOR
Anthony G. Gorman, Ruislip, and John R. Peacock, Stone, Nr. Aylesbury, both of England, assignors to Racal Acoustics Limited, Middlesex, England
Filed Mar. 25, 1983, Ser. No. 479,084
Claims priority, application United Kingdom, Nov. 16, 1982, 1009738
Term of patent 14 years
U.S. Cl. D13—24



284,757
ADAPTER BASE FOR ELECTRIC LAMP
Herman J. Engel, 9832 Dungan Rd., Philadelphia, Pa. 19115
Filed Jul. 7, 1983, Ser. No. 511,772
The portion of the term of this patent subsequent to Jul. 15, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—25

284,758
POWER OUTLET BOX WITH INTEGRAL SURGE PROTECTOR
Brian J. Maloney, St. Charles, Ill., assignor to International Jensen Incorporated, Schiller Park, Ill.
Filed Apr. 25, 1983, Ser. No. 488,138
Term of patent 14 years
U.S. Cl. D13—30



284,759

PORTABLE RADIO TELEPHONE OR SIMILAR ARTICLE

Albert L. Nagele, Wilmette, and Kenneth W. Larson, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 25, 1983, Ser. No. 545,410

The portion of the term of this patent subsequent to Jul. 26, 1997, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—53

284,760

COMBINATION HANDSET AND BASE TELEPHONE SET

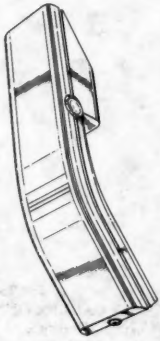
Geoffrey Keating, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

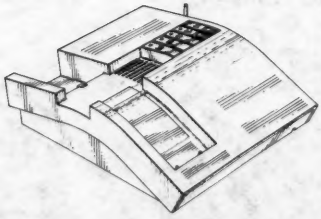
Filed Jan. 5, 1984, Ser. No. 568,560

Claims priority, application United Kingdom, Jul. 15, 1983, 1014114; Nov. 23, 1983, 1016450

Term of patent 14 years

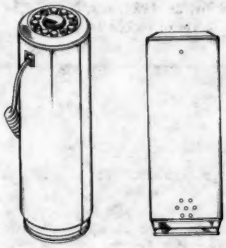
U.S. Cl. D14—53



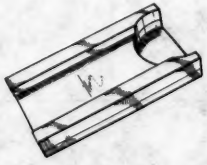


284,761
HANDSET TELEPHONE
Desmond J. Ryan, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Jun. 11, 1984, Ser. No. 619,263
Term of patent 14 years
U.S. Cl. D14—53

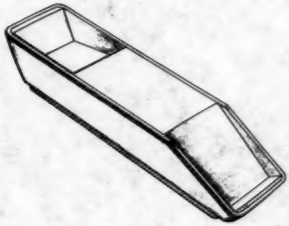
284,762
TELEPHONE
Michael Mo, 17-21, Pao Hung Rd., Hsin Tien, Taipei Hsien, Taiwan (231)
Filed Jul. 17, 1984, Ser. No. 631,679
Term of patent 14 years
U.S. Cl. D14—53

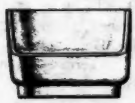


284,763
BASE FOR A TELEPHONE HANDSET
Desmond J. Ryan, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Jun. 11, 1984, Ser. No. 619,262
Term of patent 14 years
U.S. Cl. D14—60



284,764
TELEPHONE CRADLE
Christian J. Felix, Flushing, N.Y.; Donald M. Genaro, Haworth, N.J., and Gordon E. Sylvester, Jamaica, N.Y., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Apr. 29, 1985, Ser. No. 728,378
Term of patent 14 years
U.S. Cl. D14—60



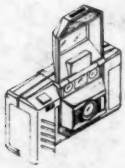


284,765
PORTABLE RADIO
Wing K. Lam, Des Voeux, Hong Kong, assignor to Win-Gold Electronics Co. Ltd., Hong Kong
Filed May 18, 1984, Ser. No. 611,886
Claims priority, application United Kingdom, Nov. 21, 1983, 1016407
Term of patent 14 years
U.S. Cl. D14—70

284,766
LAWN MOWER
Roung-Chung Chai, No. 39, Wang-Hang Village, Yung-Kang Hsiang, Tainan Hsien, Taiwan
Filed Apr. 24, 1984, Ser. No. 603,323
Term of patent 14 years
U.S. Cl. D15—16

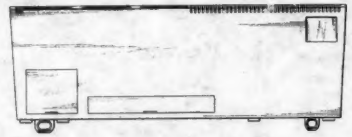
284,767
PLANTER ROW SHANK MOUNTING BRACKET
Richard H. Clark, Blue Grass, Iowa; Frank E. Ege, Moline, and William R. Lundie, East Moline, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed Dec. 24, 1984, Ser. No. 685,422
Term of patent 14 years
U.S. Cl. D15—33

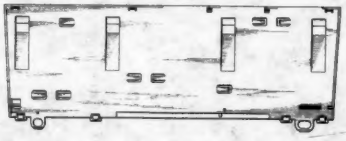
284,768
35MM CAMERA
Yasuhiko Nakayama, Suwa, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan
Filed Aug. 6, 1984, Ser. No. 637,956
Claims priority, application Japan, Feb. 22, 1984, 59-6451
Term of patent 14 years
U.S. Cl. D16—6

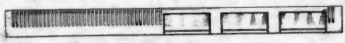


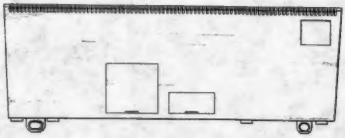
284,769
PAIR OF SPECTACLES
Malcolm J. MacWilliamson, 1700 Shelton Dr., P.O. Box 261, Hollister, Calif. 95023
Filed Jan. 22, 1985, Ser. No. 693,580
Term of patent 14 years
U.S. Cl. D16—118

284,770
FUNCTION PACK FOR A TYPEWRITER
Peter J. Mendel, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 29, 1984, Ser. No. 676,347
Term of patent 14 years
U.S. Cl. D18—12

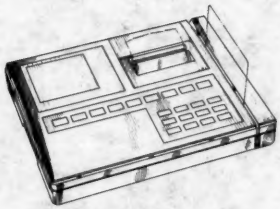








284,771
MENU PRINTER
Kenji Tamada, and Tadashi Yanagi, both of Tokyo, Japan, assignors to Silver Seiko Limited, Japan
Filed Apr. 25, 1984, Ser. No. 603,588
Term of patent 14 years
U.S. Cl. D18—13

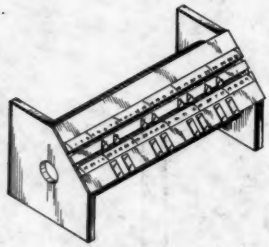


284,772
EMBOSSING DEVICE
Stephen A. Bloom, Miami Beach, Fla., assignor to No Fraud International, Inc., Miami Beach, Fla.
Filed May 11, 1984, Ser. No. 609,228
Term of patent 14 years
U.S. Cl. D18—14

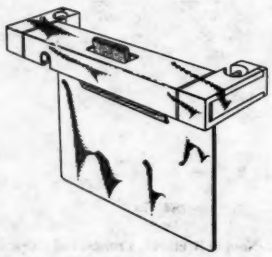
284,773
PEN
Allan E. Schwartz, 3 Bristol Pl., Yonkers, N.Y. 10710, and Richard E. Frenkel, 33 Park Rd., Scarsdale, N.Y. 10583
Filed Apr. 23, 1984, Ser. No. 602,957
Term of patent 14 years
U.S. Cl. D19—48

284,774
PEN
Pierre Ludvig, St-Nom la Breteche, France, and Gerard Flandin, 11 Rue Alfred Dehodencq, 75016 Paris, France, assignors to Gerard Flandin, Paris, France
Filed May 8, 1984, Ser. No. 608,142
Term of patent 14 years
U.S. Cl. D19—49

284,775
SPELLING GAME EDUCATIONAL UNIT
Joseph S. Akiyama, 3291 S. Holly Pl., Denver, Colo. 80222
Filed Oct. 17, 1983, Ser. No. 542,604
Term of patent 14 years
U.S. Cl. D19—64



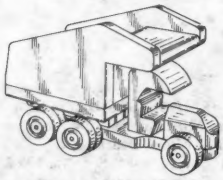
284,776
CLIP BOARD
Raymond J. McKinnon, Jr., Castro Valley, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Apr. 6, 1983, Ser. No. 483,059
Term of patent 14 years
U.S. Cl. D19—88



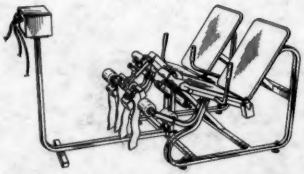
284,777
HOLDER FOR A MULTIPLE PHOTOGRAPH AND INFORMATION MAT AND TELEPHONE DIRECTORY
Alfred A. Anthony, 10 Bradley St., Westport, Conn. 06880
Filed Apr. 28, 1983, Ser. No. 489,484
Term of patent 14 years
U.S. Cl. D19—91

284,778
ADVERTISING DISPLAY UNIT
James W. Clifford, St. Paul, and Rodney I. Eaton, Minneapolis, both of Minn., assignors to Associated Images, Inc., Minneapolis, Minn.
Filed Jul. 5, 1983, Ser. No. 510,576
Term of patent 14 years
U.S. Cl. D20—10

284,779
TOY DUMP TRUCK
John Dorelli, 315 Rose St., Glenwood, Ill. 60425
Filed Apr. 2, 1984, Ser. No. 595,578
Term of patent 14 years
U.S. Cl. D21—134



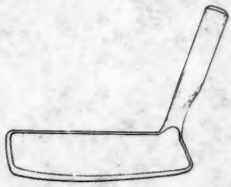
284,780
DUAL SEAT PHYSICAL EXERCISER
Jerry D. Brentham, 2121 Industrial Park Rd., Belton, Tex. 76513
Filed May 11, 1984, Ser. No. 609,578
Term of patent 14 years
U.S. Cl. D21—195



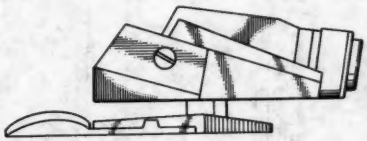
284,781
WEIGHT ASSEMBLY
Scott B. Olson, Bloomington, Minn., assignor to North American Sports Training Corporation, Minneapolis, Minn.
Filed Feb. 13, 1984, Ser. No. 579,254
Term of patent 14 years
U.S. Cl. D21—196

284,782
CROQUET POST
John T. Sahler, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,495
Term of patent 14 years
U.S. Cl. D21—202

284,783
PUTTER
William B. Shearer, 2905 W. Main St., Muncie, Ind. 47305
Filed Nov. 21, 1983, Ser. No. 554,001
Term of patent 14 years
U.S. Cl. D21—217

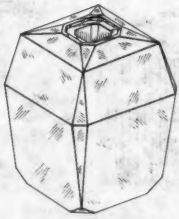


284,784
SKI BINDING
Jean-Francois Mermillod, Annecy, France, assignor to Salomon S.A., Annecy, France
Filed Aug. 17, 1983, Ser. No. 523,889
Claims priority, application France, Feb. 17, 1983, 83 1253
Term of patent 14 years
U.S. Cl. D21—230

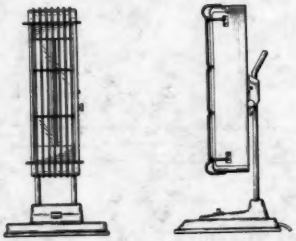


284,785
SPRINKLER STAKE
Jack L. Lemkin, Cincinnati, and Carl A. Peterson, Columbus, both of Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio
Filed May 7, 1984, Ser. No. 607,928
Term of patent 14 years
U.S. Cl. D23—7

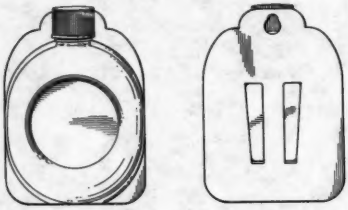
284,786
VALVE HANDLE
Donald W. Doman, Janesville; William R. Davis, Kiel, and Mark D. Van De Wege, Oostburg, all of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Dec. 7, 1983, Ser. No. 558,809
Term of patent 14 years
U.S. Cl. D23—28



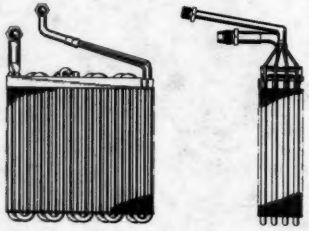
284,787
ELECTRIC RADIANT HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Nov. 8, 1983, Ser. No. 549,710
Claims priority, application Japan, May 19, 1983, 58-21237
Term of patent 14 years
U.S. Cl. D23—123



284,788
COMBINED AIR FRESHENER DISPENSER AND WALL-MOUNTED SUPPORT THEREFOR
Piet C. Cahuzak, Amersfoort, Netherlands, assignor to Intradal Nederland B.V., Amersfoort, Netherlands
Filed Oct. 26, 1983, Ser. No. 545,619
Claims priority, application Hague, Sep. 9, 1983, DM/002857
Term of patent 14 years
U.S. Cl. D23—150

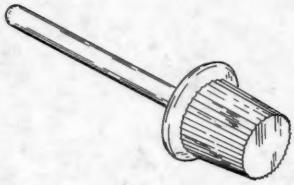


284,789
EVAPORATOR FOR AN AUTOMOTIVE AIR CONDITIONER
Shelton E. Taylor, 4112 Oakellar, Tampa, Fla. 33611
Continuation-in-part of Ser. No. 342,597, Jan. 25, 1982. This application Nov. 18, 1983, Ser. No. 552,927
Term of patent 14 years
U.S. Cl. D23—163

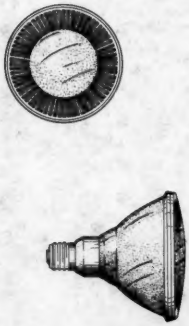


284,790
COMBINED STETHOSCOPE HEAD AND FLEXIBLE SOUND TUBE
Jerome Moore, 3061 E. Overlook Rd., Cleveland Heights, Ohio 44118
Filed Dec. 11, 1984, Ser. No. 680,305
Term of patent 14 years
U.S. Cl. D24—20

284,791
ORNAMENTAL DESIGN FOR A MEDICAL DEVICE FOR THE TREATMENT OF PROSTATITIS
Walling D. Vreeland, Jr., 3910 Country Club Rd., Winston-Salem, N.C. 27104
Filed Jun. 7, 1982, Ser. No. 385,512
Term of patent 14 years
U.S. Cl. D24—36



284,792
SPOT LAMP
William Thiry; Arnold E. Westlund, Jr., and Clarence D. Puckett, all of Winchester, Ky., assignors to GTE Products Corporation, Stamford, Conn.
Filed Aug. 18, 1983, Ser. No. 524,480
Term of patent 14 years
U.S. Cl. D26—2

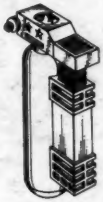


284,793
COMBINED FLUORESCENT LAMP AND ELECTRICAL ADAPTER THEREFOR
Herman J. Engel, 9832 Dungan Rd., Philadelphia, Pa. 19115
The portion of the term of this patent subsequent to Aug. 5, 2000, has been disclaimed.
Filed Jul. 7, 1983, Ser. No. 511,731
Term of patent 14 years
U.S. Cl. D26—3

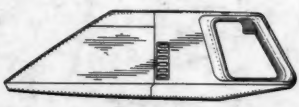
284,794
CIGARETTE LIGHTER
Yoshio Hirota, Tokyo, Japan, assignor to Kabushiki Kaisha Hirota, Tokyo, Japan
Filed Dec. 6, 1984, Ser. No. 678,853
Claims priority, application Japan, Jun. 12, 1984, 59-23835
Term of patent 14 years
U.S. Cl. D27—41

284,795
TOBACCO LOADER
James W. Webb, 2203 Grant Ave., Redondo Beach, Calif. 90278
Filed Aug. 27, 1984, Ser. No. 644,368
Term of patent 14 years
U.S. Cl. D27—51

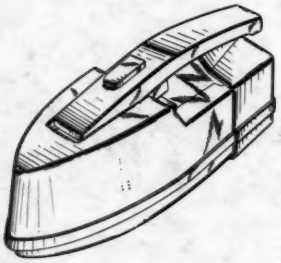
284,796
LIGHTER
Sadao Yoshinaga, Chiba, Japan, assignor to Banning Enterprises, Ltd., Bellmore, N.Y.
Filed Feb. 29, 1984, Ser. No. 584,801
Claims priority, application Japan, Oct. 17, 1983, 58-44969
Term of patent 14 years
U.S. Cl. D27—41



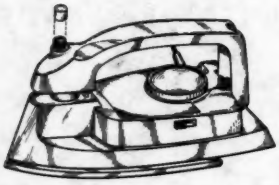
284,797
PORTABLE VACUUM CLEANER
Ichiro Fujii, Hirakata; Kuniyuki Shimoo, Moriguchi, and Hiroshi Yajima, Shijonawate, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Dec. 16, 1983, Ser. No. 562,428
Claims priority, application Japan, Jun. 17, 1983, 58-26268
Term of patent 14 years
U.S. Cl. D32—18



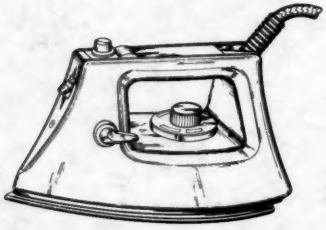
284,798
STEAM IRON
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Sep. 21, 1984, Ser. No. 653,517
Term of patent 14 years
U.S. Cl. D32—69



284,799
TRAVEL IRON
Norman A. Steinkamp, LaGrange Park, Ill., assignor to John Zink Company, Tulsa, Okla.
Filed Apr. 16, 1984, Ser. No. 600,748
Term of patent 14 years
U.S. Cl. D32—70

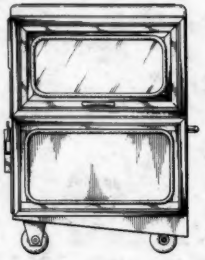


284,800
STEAM IRON
Alfredo Cavalli, Via Galileo Galilei, 9, Pessano Con Bornago (Milan), Italy
Filed Apr. 19, 1984, Ser. No. 602,212
Term of patent 14 years
U.S. Cl. D32—70

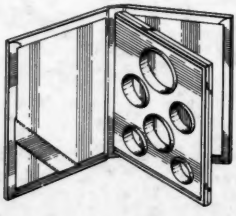


284,801
LOG FEEDER
Albert H. Hauser, 3643 Dozier Rd., Pfafftown, N.C. 27040
Filed May 27, 1983, Ser. No. 498,817
Term of patent 14 years
U.S. Cl. D34—28

284,802
FOOD WAGON
Vahe Karapetian, 4801 Los Feliz Blvd., Los Angeles, Calif. 90027
Filed Dec. 21, 1983, Ser. No. 563,964
Term of patent 14 years
U.S. Cl. D34—19



284,803
SPECIMEN COIN CASE
Fred J. Povitz, Montreal, Canada, assignor to Corporation d'Emballage Universel/Universal Package Corporation, Mount Royal, Canada
Filed Nov. 21, 1983, Ser. No. 553,890
Claims priority, application Canada, Sep. 21, 1983, 21-09-83-3
Term of patent 14 years
U.S. Cl. D99—34



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TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF JULY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aarts, Hubertus H., to Ruti-te Strake B.V. Device for fixing an auxiliary member or accessory upon the reed of a shuttleless loom or weaving machine. 4,601,313, Cl. 139-194.000.

AB Electrolux: *See—*
Larsson, Nils F., 4,602,178, Cl. 310-71.000.

Abbott Laboratories: *See—*
Fukui, George M.; Spencer, Herbert J.; and Williams, Laurens R., II, 4,602,007, Cl. 514-159.000.
Larkin, Mark E., 4,601,704, Cl. 604-87.000.

Abbott, Martyn S., to Quest Medical, Inc. Method and apparatus for detecting leaking valves in a volumetric infusion device. 4,602,249, Cl. 340-605.000.

Abe, Atsushi: *See—*
Nomura, Koji; Ogawa, Hisahito; Abe, Atsushi; and Nitta, Tsuneharu, 4,602,192, Cl. 315-169.300.

Abernathey, John R.; Lasky, Jerome B.; Nesbit, Larry A.; Sedgwick, Thomas O.; and Stiffler, Scott; R., to International Business Machines Corporation. Method of producing a thin silicon-on-insulator layer. 4,601,779, Cl. 156-628.000.

ABU Aktiebolag: *See—*
Moosberg, Borje S., 4,601,439, Cl. 242-84.52B.

Acampora, Alfonse; and Petri, Robert J., to RCA Corporation. IYQY format television signal encoding and decoding apparatus. 4,602,274, Cl. 358-11.000.

Access Corporation: *See—*
Neumeier, Paul J., 4,601,397, Cl. 209-608.000.

Acker, Richard C., to Teledyne Industries, Inc. Sub-sea pilot-operated valve. 4,601,311, Cl. 137-625.660.

Action Industries, Inc.: *See—*
Pine, James J., 4,601,513, Cl. 297-270.000.

ACTV, Inc.: *See—*
Freeman, Michael J., 4,602,279, Cl. 358-86.000.

Adachi, Yuma: *See—*
Asai, Eiichi; Komaki, Takao; and Adachi, Yuma, 4,602,156, Cl. 250-327.200.

Adelman, Herbert B., to Crowell Corporation, The. Automatic packaging. 4,601,157, Cl. 53-450.000.

Adtech, Inc.: *See—*
McClure, Harry A., 4,601,885, Cl. 422-114.000.

Advantest Corp.: *See—*
Kurihara, Takenori, 4,602,220, Cl. 331-19.000.

Adwalpalker, Avinash S.; Harvilchuck, Joseph M.; Ranalli, Joseph R.; and Rich, David W., to International Business Machines Corporation. Stripped gold plating process. 4,601,424, Cl. 228-124.000.

Aerzener Maschinenfabrik GmbH: *See—*
Seidel, Gunter, 4,601,643, Cl. 417-247.000.

Agee, John H. Stowable truck ramp with extension sleeve. 4,601,632, Cl. 414-537.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Hofmann, Wilfried; Holzmann, Andreas; Koopmann, Adolf; Meggendorfer, Ruth; and Sylla, Jurgen, 4,601,558, Cl. 353-27.00R.
Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, 4,602,303, Cl. 360-74.600.

Ahlstone, Arthur G., to Shell Offshore Inc. Subsea hydraulic connection method and apparatus. 4,601,608, Cl. 405-169.000.

Aiba, Masahiko; and Furukawa, Koichi, to Sharp Kabushiki Kaisha. Paper sheet setting mechanism in a printer. 4,601,595, Cl. 400-637.000.

Aichi Tokei Denki Co., Ltd.: *See—*
Amata, Yoshitaka, 4,601,209, Cl. 73-861.170.

Aihara, Osamu: *See—*
Furubayashi, Toshio; Funatsu, Takenori; Inuzuka, Yoichi; Aihara, Osamu; and Hayashi, Mikio, 4,601,759, Cl. 106-308.00M.

Aihara, Satoshi; and Tanizawa, Tetsu, to Fujitsu Limited. Method of manufacturing master-slice integrated circuit device. 4,602,339, Cl. 364-490.000.

Aillon, Rene . Central venous pressure catheter for preventing air embolism and method of making. 4,601,706, Cl. 604-122.000.

Aine, Harry E. Swimming pool cover. 4,601,072, Cl. 4-499.000.

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Ferretti, Michael D.; Gabel, Brian L.; and Horton, James A., 4,602,344, Cl. 364-509.000.
Riley, Eric K.; Dudill, Roger; and Young, Philip J., 4,601,655, Cl. 431-116.000.

Airtech, Inc.: *See—*
Barnes, James O.; and Leary, David J., 4,601,914, Cl. 427-87.000.

Ajinomoto Co., Inc.: *See—*
Kaneko, Tetsuya; Saeki, Masaru; Tanaka, Kiyoshi; and Kawakita, Tetsuya, 4,601,829, Cl. 210-638.000.
Nakamori, Shigeru; Ishida, Masaaki; Takagi, Hiroshi; Miwa, Kiyoshi; Ito, Koichi; and Sano, Konosuke, 4,601,983, Cl. 435-115.000.
Shiio, Isamu; Sugimoto, Shinichi; and Kawamura, Kazue, 4,601,982, Cl. 435-108.000.

Akahori, Masaaki: *See—*
Yamada, Kazumori; and Akahori, Masaaki, 4,602,254, Cl. 340-825.480.

Akehurst, Sidney D.: *See—*
Johnson, Frank; and Akehurst, Sidney D., 4,601,187, Cl. 72-64.000.

Akin, Hurston B. Means for adjusting an extractor for cotton stripper. 4,601,084, Cl. 19-202.000.

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Kago, Yoshiyuki; and Akita, Shigeyuki, 4,602,256, Cl. 340-825.720.
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Akiyama, Hiroyuki; Izawa, Susumu; and Kuwabara, Hideki, to Japan Styrene Paper Corporation. Propylene-base random copolymer particles and production process thereof. 4,602,082, Cl. 528-481.000.

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Deneke, Albert; and Pedersen, Kurt F. L., 4,602,136, Cl. 200-50.00A.

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Weidenhaupt, Wolfgang; Wepner, Gunter; and Dismon, Peter, 4,601,165, Cl. 57-213.000.

Akzona Incorporated: *See—*
Latussek, Eberhard, 4,601,937, Cl. 428-132.000.

Alameda, Robert: *See—*
Lewis, Paul A., 4,601,155, Cl. 53-176.000.

Albany International Corp.: *See—*
Lilja, Roland E.; and Nilsson, Sven B., 4,601,785, Cl. 162-199.000.

Albisser, Anthony M.; and Zinman, Bernard. Insulin infusion device. 4,601,707, Cl. 604-131.000.

Albrecht, Linda: *See—*
Wolfram, Leszek J.; and Albrecht, Linda, 4,601,299, Cl. 132-7.000.

Alform Alloys Limited: *See—*
Maddock, Brian, 4,601,325, Cl. 164-476.000.

ALH Systems Limited: *See—*
Clark, John R. G.; and Wade, Philip J., 4,601,604, Cl. 404-69.000.

Allen, Donald E.; Gross, Richard A.; and Knuth, Howard D., to Motorola, Inc. Method of fabricating air supported crossovers. 4,601,915, Cl. 427-96.000.

Allen, James A.: *See—*
Lancaster, Gerald M.; and Allen, James A., 4,601,948, Cl. 428-349.000.

Allied Corporation: *See—*
Fujawa, Charles S.; and Argyelan, David J., 4,602,324, Cl. 364-130.000.
Galle, James E.; Mares, Frank; Diamond, Steven E.; Corsi, Jeffrey; and Regina, Francis J., 4,601,859, Cl. 558-459.000.
Levine, Samuel W., 4,601,958, Cl. 428-672.000.
Webster, Milo E., 4,601,881, Cl. 422-67.000.

Allison, Alfred E.; and Dillard, Ronald J. Helicopter simulator. 4,601,663, Cl. 434-33.000.

Allison, John E., Jr.: *See—*
Smith, Gerald R.; and Allison, John E., Jr., 4,601,795, Cl. 204-16.000.

Allwin, Roger P.: *See—*
Lindsey, Hiram E., Jr.; Allwin, Roger P.; and Yokley, John M., 4,601,343, Cl. 166-382.000.

Alps Electric Co., Ltd.: *See—*
Kawasaki, Kenzo, 4,602,137, Cl. 200-76.000.

Althaus, Wolfgang, to Wilkinson Sword Limited. Safety razors and travel caps therefor. 4,601,392, Cl. 206-349.000.

Aluminum Company of America: *See—*
Powers, John H.; and Dang, Hang T., 4,601,796, Cl. 204-33.000.
Robak, Casimir B.; Ramsey, Everett M.; Beil, Gary A.; and Gray, Bruce A., 4,601,750, Cl. 75-65.00R.

Alwin Welsch Polstermobelfabrik KG: *See—*
Welsch, Bertram; and Blauw, Gunther, 4,601,074, Cl. 5-47.000.

ALZA Corporation: *See—*
Wong, Patrick S. L.; Langston, Jimmy B.; and Leeper, Harold M., 4,601,880, Cl. 422-28.000.

Amano, Itaru; Kurumaji, Masanobu; Misumi, Shikao; Fujieda, Yasuhiko; and Kanzawa, Masahide, to Kabushiki Kaisha Kobe Seiko Sho. Mold clamp mechanism for tire press. 4,601,648, Cl. 425-47.000.

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Pricone, Robert M.; and Roberts, William N., 4,601,861, Cl. 264-1.600.

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Sundheimer, Craig S., 4,601,300, Cl. 134-95.000.

Ameron, Inc.: *See*—
Ulrich, Ronald G.; and Friedrich, Ralph S., 4,601,496, Cl. 285-156.000.
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Amoco Corporation: *See*—
Palm, John W.; and Kunkel, Lorenz V., 4,601,330, Cl. 165-95.000.
Valcho, Joseph J.; Lindberg, Steven E.; Hunt, Mack W.; and Sabol, Albert R., 4,601,837, Cl. 252-40.700.
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Amorese, Franklyn J., to Kennecott Corporation. Multi-hubbed separable blade agitators. 4,601,583, Cl. 366-343.000.

AMP Incorporated: *See*—
Coldren, Daniel R.; Davis, Wayne S.; and Fortuna, Jon A., 4,601,530, Cl. 339-103.00M.
Kandybowski, Steven J., 4,601,525, Cl. 339-75.0MP.

Ampex Corporation: *See*—
Beaulier, Daniel A.; and Marsh, Theodore A., 4,602,285, Cl. 358-160.000.

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Hemmah, Steven M.; and Payne, Richard S., 4,601,760, Cl. 148-1.500.

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Anderson, Marvin H.: *See*—
Kneip, George D., Jr.; Broshear, John H.; and Anderson, Marvin H., 4,601,175, Cl. 62-50.000.

Andersson, Torbjorn: *See*—
Aslund, Christer; and Andersson, Torbjorn, 4,601,878, Cl. 419-49.000.

Ando, Minato; Ito, Masaaki; and Kato, Takashi, to NGK Spark Plug Co., Ltd. High-alumina ceramic composition. 4,601,990, Cl. 501-153.000.

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Andrews, Robert S., to United States of America, Air Force. Hydraulic pressure intensifier. 4,601,642, Cl. 417-225.000.

Angewandte Digital Elektronik GmbH: *See*—
Kreft, Hans-Dietrich, 4,602,253, Cl. 340-825.310.

Ansel, Robert E.: *See*—
Brown, Wallace H.; Ansel, Robert E.; and Murray, Kevin P., 4,601,757, Cl. 106-183.000.

Anthony, George M. Heat transfer method and apparatus. 4,601,173, Cl. 60-667.000.

Antonello, Flamino. Device for moving objects. 4,601,386, Cl. 198-576.000.

Appelberg, Gustaf T., to Research Activities, Incorporated. Information distribution system. 4,602,340, Cl. 364-492.000.

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Sherman, Robert M.; and Fuerst, Charles O., 4,601,821, Cl. 210-169.000.

Arachtingi, James J., to Kollmorgen Technologies Corporation. Process for bonding metals to electrophoretically deposited resin coatings. 4,601,916, Cl. 427-97.000.

Arai, Kazuyoshi: *See*—
Kato, Masaaki; Tojo, Shigeki; and Arai, Kazuyoshi, 4,601,269, Cl. 123-300.000.

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Finn, William A.; and Searfass, Harry I., 4,601,942, Cl. 428-222.000.

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Levine, Robert A.; Davis, Danny F.; and Cordeiro, Anthony W., 4,601,203, Cl. 73-432.00R.
Schuh, Frank J.; and Striegler, John H., 4,601,353, Cl. 175-41.000.
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Keel, Jerry L., 4,602,216, Cl. 324-126.000.

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Lai, John T., 4,601,839, Cl. 252-51.50A.
Traynor, Lee, 4,602,090, Cl. 546-272.000.

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Gill, William A., 4,601,222, Cl. 82-4.00C.

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Bachner, Larry G., to Nimco Corporation. Nonwicking bottom closure for a liquid-tight container. 4,601,425, Cl. 229-17.00G.

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Ordines, Jean-Pierre; Bacot, Dominique; and Detroyat, Jean-Michel, 4,601,733, Cl. 55-139.000.

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Haugen, David M., 4,601,498, Cl. 285-332.300.

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Phillipson, John G., 4,601,383, Cl. 198-448.000.

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Andresen, Finn H.; Balschmidt, Per; Hejnos, Kim R.; and Kofod, Hans, 4,601,979, Cl. 435-70.000.

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Geary, David F.; Schinner, Edward N.; and Shriver, George R., 4,601,684, Cl. 474-144.000.

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Forester, David R.; and Barlow, Raymon C., 4,601,815, Cl. 208-120.000.

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Markus, Michael V.; and Barnett, George H., 4,602,045, Cl. 521-27.000.

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Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., 4,602,095, Cl. 548-532.000.

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Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,601,354, Cl. 175-46.000.

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Bartholomew, Donald D., to Proprietary Technology. Swivelable quick connector assembly. 4,601,497, Cl. 285-319.000.

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Bartmann, Martin; and Burzin, Klaus, to Huels Aktiengesellschaft. Cyclododec-2-enyl ethers in fragrance compositions. 4,601,851, Cl. 252-522.00R.

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Weiss, Franz-Josef; Habermann, Wolfgang; Hammes, Peter; Ritz, Josef; Thomas, Erwin; and Thoma, Peter, 4,601,800, Cl. 204-182.400.
Wisseroth, Karl, 4,601,251, Cl. 114-23.000.

Bates, Norman H., to Tandem Group, Inc., The. Locking mechanism for an office panel system. 4,601,137, Cl. 52-63.000.

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Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; and Benko, Pal, 4,602,018, Cl. 514-243.000.

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Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,602,033, Cl. 514-452.000.
Lantzsch, Reinhard, 4,602,117, Cl. 568-393.000.
Streuff, Bernhard; and Putter, Johann, deceased, 4,601,895, Cl. 424-35.000.
Waniczek, Helmut; Hohmann, Gerhard; Bartl, Herbert; and Mott, Ludwig, 4,602,056, Cl. 524-272.000.
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Ziemann, Heinz; and Mohrmann, Karl-Heinrich, 4,602,115, Cl. 568-376.000.

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Kolitsch, Jorg, 4,601,198, Cl. 73-118.000.

BBC Brown, Boveri & Co., Ltd.: *See—*
Kunzli, Roland; and Rydstad, Hans, 4,601,186, Cl. 72-21.000.

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Wenzlick, Erich; and Rothfuss, Hermann, 4,601,523, Cl. 312-330.00R.

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Beaulier, Daniel A.; and Marsh, Theodore A., to Ampex Corporation. System and method for transforming and filtering a video image. 4,602,285, Cl. 358-160.000.

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Harry, Ieuan L.; Krihsnakumar, Suppayan M.; Jolly, Walter R.; and Beck, Martin H., 4,601,869, Cl. 264-523.000.

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Sperry, Elmer A., III; and Cluzel, John M., 4,602,162, Cl. 250-436.000.

Beckmann, Franz: *See—*
Dungs, Horst; Beckmann, Franz; and Birscheidt, Henri, 4,601,728, Cl. 44-10.00G.

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Newsome, Peter M.; Beeley, Lee J.; and Moss, Stephen F., 4,602,041, Cl. 514-634.000.

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Stier, Roger E.; Dunn, William H.; and Vidra, James D., 4,601,898, Cl. 424-52.000.
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Beil, Gary A.: *See—*
Robak, Casimir B.; Ramsey, Everett M.; Beil, Gary A.; and Gray, Bruce A., 4,601,750, Cl. 75-65.00R.

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Yen, Jing G.; and Popelka, David A., 4,601,639, Cl. 416-230.000.

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Fagerlund, Bertil K. E., 4,601,787, Cl. 162-45.000.

Belsole, Susan C., to Warner-Lambert Company. Meclofenamic acid topical pharmaceutical composition. 4,602,040, Cl. 514-567.000.

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Mattei, Riccardo; and Belvederi, Bruno, 4,601,297, Cl. 131-109.100.

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Regan, Robert J.; Butler, Scott J.; and Ben-Aharon, Zvi, 4,602,221, Cl. 331-117.00R.

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Capes, Charles E.; Bennett, Adam J.; Coleman, Richard D.; and Thayer, William L., 4,601,729, Cl. 44-51.000.

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Veenman, Simon J. M.; and Benraad, Coenraad J. B. M., 4,601,393, Cl. 206-505.000.

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Schafer, Paul; and Berendt, Hans-Ulrich, 4,602,055, Cl. 524-157.000.

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Bergh, Ralph A.: *See—*
Shaw, Herbert J.; Bergh, Ralph A.; and Kotler, George A., 4,601,541, Cl. 350-320.000.

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West, Roger A.; Humphrey, Dallas R; Bergquist, Carl R.; and DeGree, David C., 4,602,125, Cl. 174-138.00G.

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Bernhard, Ragnar: *See—*
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,601,786, Cl. 162-30.100.

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de Hair, Johannes T. W.; van Kemenade, Johannes T. C.; and Berns, Everhardus G., 4,602,188, Cl. 313-487.000.

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Bertin, Claude L., to International Business Machines Corporation. Resistive gate field effect transistor logic family. 4,602,170, Cl. 307-450.000.

Bertino, Cosmo D., III; and Marucci, N. Dominic, to Syntex (U.S.A.) Inc. Temporomandibular joint articulator and dental manikin incorporating it. 4,601,664, Cl. 434-264.000.

Bertolaja, Costantino. Machine for assembling box sole footwear semi-automatically. 4,601,078, Cl. 12-1.00F.

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Forester, David R.; and Barlow, Raymon C., 4,601,815, Cl. 208-120.000.

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Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,602,024, Cl. 514-357.000.

Bianchi, Jacqueline K.; Gdula, Robert A.; and Lange, Dennis J., to International Business Machines Corp. Reactive ion etching process. 4,601,782, Cl. 156-643.000.

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Billet, Claude, to Treficable Pirelli. Device for interconnecting overhead and underground low-voltage electric cables. 4,601,529, Cl. 339-60.00M.

Billing, Lars T.; and Olofsson, Stig. Nail feeding device. 4,601,408, Cl. 221-168.000.

Bird, Henry B. Automobile roof-mounted carrier. 4,601,419, Cl. 224-318.000.

Birkes, Stephen; Hill, Donna L.; and Pfahl, Kurt, to Hallmark Cards, Inc. Special light effect visual ornaments. 4,601,924, Cl. 428-7.000.

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Bjorklund, John G., 4,601,789, Cl. 202-167.000.

Black & Decker Inc.: *See—*
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Bach, Hartwig C.; and Black, William B., 4,601,949, Cl. 428-374.000.

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Blain, Roy W. Down valve for the down speed control of a hydraulic elevator. 4,601,366, Cl. 187-17.000.

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Eumann, Hanns-Heinz; and Blank, Winfried, 4,601,808, Cl. 204-301.000.

Blauhut, Reinhold; and Maciejewski, Boguslaw, to Atlas Fahrzeugtechnik GmbH. Measuring circuit for ionic current measurement. 4,601,193, Cl. 73-35.000.

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Bloomfield Industries, Inc.: *See—*
Roberts, Melvin F., 4,602,145, Cl. 219-297.000.

Blumle, Martin, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Apparatus for aligning flat articles. 4,601,388, Cl. 198-726.000.

Bock, Thomas J., to Borg-Warner Corporation. Variable pulley torque drive means. 4,601,679, Cl. 474-11.000.

Boden, Richard M., to International Flavors & Fragrances Inc. 1-hydroxymethyl-2-isopropenyl-1,5-dimethylcyclopentane, n-propyl ester thereof and organoleptic uses thereof. 4,601,850, Cl. 252-522.00R.

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Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,601,835, Cl. 252-8.900.

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McEldowney, Paul A., 4,601,618, Cl. 408-1.00R.
Opsahl, Allan W., 4,601,446, Cl. 244-129.500.
Riemer, Gerald K., 4,601,405, Cl. 220-1.500.

Boens, Richard L.: *See—*
Swales, Barton L.; and Boens, Richard L., 4,601,372, Cl. 192-67.00R.

Bogle, Robert W.; Gero, Gary; and Wald, Stephen L. Motion picture camera automatic focusing system. 4,601,557, Cl. 352-140.000.

Bohle, Werner, to Gewerkschaft Eisenhutte Westfalia. Gearing units for use with mining apparatus. 4,601,218, Cl. 74-785.000.

Bohm, Horst: *See—*
Grimm, Rainer; and Bohm, Horst, 4,601,091, Cl. 29-423.000.

Bolt, Murray H.: *See—*
Herman, Alexander; Bolt, Murray H.; and Scavezze, Daniel C., 4,602,364, Cl. 370-85.000.

Bonato, Emil, to Centricon Maschinenbau Emil Bonato & Co. KG. Mold for manufacturing objects by a centrifugal casting method. 4,601,923, Cl. 425-425.000.

Bond, Curtis J., to Liqui-Box Corporation. Collapsed bag with evacuation channel form unit. 4,601,410, Cl. 222-92.000.

Bond, Malcolm L.; and Dempster, Philip T., to Loredan Biochemical, Inc. Exercise and diagnostic system and method. 4,601,468, Cl. 272-130.000.

Bongers, Bernd, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Crash protection structural component. 4,601,367, Cl. 188-376.000.

Boots, Robert T., to Vermeulen-Hollandia Octrooien II B.V. Open roof-construction for a vehicle. 4,601,512, Cl. 296-221.000.

Borg-Warner Chemicals, Inc.: *See—*
Carr, Lawrence J.; Nichols, George M.; and Rose, Selwyn H., 4,601,843, Cl. 252-78.500.

Borg-Warner Corporation: *See—*
Bock, Thomas J., 4,601,679, Cl. 474-11.000.

Bornhorst, James M., to Vari-Lite, Inc. Light source having automatically variable hue, saturation and beam divergence. 4,602,321, Cl. 362-268.000.

Boroschewski, Gerhard: *See—*
Westermann, Jurgen; Boroschewski, Gerhard; Eder, Ulrich; Arndt, Friedrich; Krahmer, Hansjorg; and Kotter, Clemens, 4,601,746, Cl. 71-92.000.

Borror, Alan L.; Ellis, Ernest W.; and McGowan, Donald A., to Polaroid Corporation. Thermal imaging method. 4,602,263, Cl. 346-201.000.

Borucki, John S.: *See—*
Dunn, James J.; and Borucki, John S., 4,601,153, Cl. 52-666.000.

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Gabbay, Moses A.; and Oum, Sang O., 4,602,382, Cl. 381-90.000.

Bottcher, Alfred: *See—*
Bertram, Wilhelm; Bottcher, Alfred; and Siegmann, Carl, 4,601,597, Cl. 401-1.000.

Boute, Willem; Stoop, Guus; van Arragon, Gerrit W.; and Mensink, Kornelis A., to Vitafin N.V. Biomedical system with improved marker channel means and method. 4,601,291, Cl. 128-419.0PT.

Bouyoucos, John V.; and Durfee, David W., to Hydroacoustics, Inc. Method and apparatus for treating plastic welds to relieve stresses therein. 4,601,768, Cl. 156-73.500.

Bowman, Kenneth A., to DRG (UK) Limited. Book making apparatus and method with divertor between bindaries. 4,601,462, Cl. 270-12.000.

Boyd, Gary D.; Cheng, Julian; Meyer, Robert B.; and Thurston, Robert N., to AT&T Bell Laboratories. Nematic liquid crystal storage display device. 4,601,543, Cl. 350-334.000.

BP Chemicals Limited: *See*—
Kelly, Raymond L., 4,602,100, Cl. 549-529.000.

Bragdon, Harold W., to Med Care of Kansas, Incorporated. Infrared battery detector and charging system. 4,602,203, Cl. 320-2.000.

Brammer, Norman: *See*—
Bell, James L., Jr.; Thatcher, Mark T.; Phillips, Brian K.; Brammer, Norman; and Sweeney, Thomas F., 4,601,491, Cl. 285-24.000.

Brand, Robert D., to Capital Machine Company, Inc. Veneer slicing system. 4,601,317, Cl. 144-178.000.

Brandenberger, Urs; Henych, Ivo; Hornung, Klaus; and Menk, Werner, to Georg Fischer AG. Process for the production of cast iron containing spherical graphite. 4,601,751, Cl. 75-130.00R.

Brandon, David A., to George F. Valassis & Company. Multi-coupon sweepstakes promotion vehicle. 4,601,490, Cl. 283-56.000.

Branzoli, Umberto: *See*—
Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, 4,602,022, Cl. 514-337.000.

Braun, Robert L.: *See*—
Lewis, Arthur E.; Braun, Robert L.; Mallon, Richard G.; and Walton, Otis R., 4,601,811, Cl. 208-410.000.

Breen, Jonathon; and Petursson, Drew. Cane having handle with stop member. 4,601,302, Cl. 135-66.000.

Breese, Leonard S., to Thermalloy Incorporated. Compensating roll pin for heat sink mounting. 4,602,315, Cl. 361-388.000.

Brennan, Michael E., to Texaco Inc. Production of ethylenediamine and N-aminoethylpiperazine from piperazine. 4,602,091, Cl. 544-402.000.

Brennan, Michael E.: *See*—
Duranleau, Roger G.; and Brennan, Michael E., 4,602,085, Cl. 536-17.200.

Brenteson, Donald I. Tree stand support and display apparatus. 4,601,399, Cl. 211-60.100.

Bresson, Clarence R.; and Kimble, Kenneth B., to Phillips Petroleum Company. Ore flotation. 4,601,818, Cl. 209-166.000.

Bretz, Karl-Heinz: *See*—
Derleth, Helmut; Sauer, Guenther; and Bretz, Karl-Heinz, 4,601,992, Cl. 502-64.000.

Bridgestone Corporation: *See*—
Tagomori, Satoshi; and Uruta, Hisaya, 4,601,611, Cl. 405-215.000.

Brinkley, Gerald E.: *See*—
Lloyd, Robert D.; Holden, Irving H.; and Brinkley, Gerald E., 4,602,311, Cl. 361-212.000.

Briscoe, Reginald; and Spector, George. Magnetic propulsion device. 4,602,173, Cl. 310-1.000.

Brisson, Alfred G.; and Nowacki, Christopher, to Trutek Research, Inc. Inhalation transducer circuit with DC drift compensation. 4,602,171, Cl. 307-491.000.

Bristol, James A.: *See*—
Sircar, Ila; and Bristol, James A., 4,602,019, Cl. 514-248.000.

British-American Tobacco Company Limited: *See*—
Luke, John A.; and Sugars, David E., 4,601,686, Cl. 493-43.000.

British Telecommunications: *See*—
Cook, John W., 4,602,338, Cl. 364-482.000.

Broadbent, Neal E., to Intel Corporation. Heat conduction mechanism for semiconductor devices. 4,602,314, Cl. 361-386.000.

Bronstert, Klaus, to BASF Aktiengesellschaft. Chlorination of polymers. 4,602,068, Cl. 525-356.000.

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Yang, Ta-Lun; and Broome, Paul, 4,602,245, Cl. 340-384.00R.
Yang, Ta-Lun; and Broome, Paul, 4,602,357, Cl. 367-93.000.

Brosenius, K. Hilding. Excess-pressure-free boiler- and accumulator heating system. 4,601,426, Cl. 237-59.000.

Broshear, John H.: *See*—
Kneip, George D., Jr.; Broshear, John H.; and Anderson, Marvin H., 4,601,175, Cl. 62-50.000.

Brough, Steve A.; and Scott, Mark P., to Keystone Industries Inc. Lading protection device. 4,601,461, Cl. 267-64.150.

Brown, Alvin E., to Manning Technologies, Inc. Flowmeter with radial vibrational mode for ultrasonic waves. 4,601,210, Cl. 73-861.270.

Brown, Edwards, Jr., to Sturm, Ruger & Company, Inc. Apparatus for increasing the rigidity of a rifle action receiver. 4,601,124, Cl. 42-75.030.

Brown, George, to GEC Avionics Limited. Guidance systems. 4,602,336, Cl. 364-456.000.

Brown, Wallace H.; Ansel, Robert E.; and Murray, Kevin P., to DeSoto, Inc. Nonvolatile plasticizers and nail polish containing the same. 4,601,757, Cl. 106-183.000.

Bruet, Philippe; Berthelon, Jean-Jacques; and Collonges, Francois, to Lipha, Lyonnaise Industrielle Pharmaceutique. (Oxo-4-4H-(1)-benzopyran-8-yl) alkanoic acids, salts and derivatives, their manufacture and medicines containing them. 4,602,034, Cl. 514-456.000.

Brumfield, Timothy L.: *See*—
Nukala, August R.; Perez, Arthur; and Brumfield, Timothy L., 4,601,381, Cl. 196-114.000.

Brunelle, Daniel J.: *See*—
Shannon, Thomas G.; and Bruneile, Daniel J., 4,601,858, Cl. 558-281.000.

Brunner, Hubert: *See*—
Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, 4,602,303, Cl. 360-74.600.

Buchanan, Delbert L.; and Buchanan, Keith W., to Buchanan Industries. Holder for knives and the like. 4,601,400, Cl. 211-70.700.

Buchanan Industries: *See*—
Buchanan, Delbert L.; and Buchanan, Keith W., 4,601,400, Cl. 211-70.700.

Buchanan, Keith W.: *See*—
Buchanan, Delbert L.; and Buchanan, Keith W., 4,601,400, Cl. 211-70.700.

Buckfelder, John J.; and Schleinitz, Henry M., to Du Pont de Nemours, E. I., and Company. Multistage annealing of aramide reverse osmosis membranes. 4,601,827, Cl. 210-500.330.

Buendia, Jean; and Vivat, Michel, to Roussel Uclaf. Process for the production of prednisone 17.21-diacylates. 4,601,854, Cl. 260-239.500.

Bugaut, Andree: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Bugaut, Andree; and Genet, Alain, 4,601,726, Cl. 8-410.000.

Bugger, Robert O.; and Cotter, Timothy W. Securing apparatus. 4,601,620, Cl. 410-22.000.

Bullis, Robert H.: *See*—
Kimberley, John A.; and Bullis, Robert H., 4,601,270, Cl. 123-357.000.

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McGowan, Thomas F.; Tessner, R. Lynnard; Cassanova, Robert A.; and Bulpitt, William S., 4,601,730, Cl. 48-76.000.

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Burk, Gerhard: *See*—
Schoppel, Roman; Mordau, Manfred; and Burk, Gerhard, 4,601,510, Cl. 296-194.000.

Burnhill, Michael S. Vaginal device. 4,601,714, Cl. 604-286.000.

Burroughs Corporation: *See*—
Lethellier, Patrice R., 4,602,323, Cl. 363-131.000.
Sheth, Jayesh V., 4,602,331, Cl. 364-200.000.

Burstell, Helmut: *See*—
Willms, Lothar; Mildenberger, Hilmar; Baur, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,601,747, Cl. 71-92.000.

Burzin, Klaus: *See*—
Bartmann, Martin; and Burzin, Klaus, 4,601,851, Cl. 252-522.00R.

Buser, Kenneth R.; and Rettig, Thomas A., to Du Pont de Nemours, E. I., and Company. Recovery of polyester from scrap by high shear conditions. 4,602,046, Cl. 521-46.000.

Butler, Scott J.: *See*—
Regan, Robert J.; Butler, Scott J.; and Ben-Aharon, Zvi, 4,602,221, Cl. 331-117.00R.

Butson, Peter C., to Picker International, Limited. Coil arrangements. 4,602,234, Cl. 335-299.000.

Byrd, James D.; and Davis, Robert T., to Morton Thiokol, Inc. Delayed quick cure rocket motor liner. 4,601,862, Cl. 264-3.100.

C. A. Weidmueller GmbH & Co.: *See*—
Wider, Hans W., 4,601,531, Cl. 339-272.00R.

Cabot Medical Corporation: *See*—
Effron, Marc H.; and Tancredi, Henry J., 4,601,290, Cl. 128-305.000.

Cadiergue, Joseph: *See*—
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Caillod, Jacques: *See*—
Dupin, Thierry; Caillod, Jacques; Leroux, Patrick; and Martino, Germain, 4,602,000, Cl. 502-335.000.

Calgaro, Honore, to S. T. Dupont. Gas flowrate regulating device for a liquefied-gas lighter. 4,601,656, Cl. 431-344.000.

Calviello, Joseph A., to Eaton Corporation. Method for fabricating buried channel field effect transistor for microwave and millimeter frequencies utilizing molecular beam epitaxy. 4,601,096, Cl. 29-571.000.

Calzaturificio Tecnica spa: *See*—
Zanatta, Ruggero, 4,601,118, Cl. 36-120.000.

Camco, Incorporated: *See*—
Pringle, Ronald E.; and Eatwell, William D., 4,601,341, Cl. 166-321.000.
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Cameron, Dugald: *See*—
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Cameron Iron Works, Inc.: *See*—
Troxell, John N., Jr., 4,601,232, Cl. 92-24.000.
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Campanelli, Michael R.: *See*—
Hawkins, William G.; Drake, Donald J.; and Campanelli, Michael R., 4,601,777, Cl. 156-626.000.

Campbell, Colin T.; Clements, Richard J.; Robinson, John F.; and Waring, Alan J., to Shell Oil Company. Apparatus and method for underwater valve component assembly and disassembly. 4,601,610, Cl. 405-188.000.

Campbell, Frank, Jr.: *See*—
Webster, Charles G.; Smith, John S.; and Campbell, Frank, Jr., 4,601,659, Cl. 432-234.000.

Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., to Chevron Research Company. Means and method for facilitating measurements while coring. 4,601,354, Cl. 175-46.000.

Campbell, Walter A. Fashion/exercise garment. 4,601,066, Cl. 2-70.000.

Canadian Fram Limited: *See*—
Cook, John E., 4,601,277, Cl. 123-571.000.

Canadian Patents and Development, Ltd.: *See*—
Capes, Charles E.; Bennett, Adam J.; Coleman, Richard D.; and Thayer, William L., 4,601,729, Cl. 44-51.000.
Canfield, Douglas M., to Casso Solar Corporation. Glass furnace with heat sensing means. 4,601,743, Cl. 65-162.000.
Cannon Mills Company: *See*—
Starnes, Dennis L.; Kimball, William G.; and Watson, Robert E., 4,601,225, Cl. 83-175.000.
Canon Kabushiki Kaisha: *See*—
Chiba, Masahiro; Iwata, Kazuo; Nakousai, Tadayuki; Ogawa, Hiroko; and Ohba, Takashi, 4,601,756, Cl. 106-22.000.
Hyosu, Yoshihiko, 4,601,968, Cl. 430-137.000.
Isohata, Junji; and Karasawa, Tamotsu, 4,601,560, Cl. 353-122.000.
Matsuda, Hiroto; Shibata, Makoto; Ikeda, Masami; and Takahashi, Hiroto, 4,602,261, Cl. 346-140.00R.
Miyawaki, Makoto; Hirohata, Michio; Ogawa, Yukio; and Kodaira, Takanori, 4,601,563, Cl. 354-195.100.
Saito, Syuichiro, 4,602,299, Cl. 360-60.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,601,964, Cl. 430-84.000.
Suzuki, Kenji, 4,602,153, Cl. 250-201.000.
Watanabe, Yoshiaki, 4,601,539, Cl. 350-255.000.
Yamamoto, Hiroshi, 4,601,564, Cl. 354-271.100.
Capes, Charles E.; Bennett, Adam J.; Coleman, Richard D.; and Thayer, William L., to Canadian Patents and Development, Ltd. Aqueous phase continuous, coal fuel slurry and a method of its production. 4,601,729, Cl. 44-51.000.
Capital Machine Company, Inc.: *See*—
Brand, Robert D., 4,601,317, Cl. 144-178.000.
Caple, Gerald; and Layton, Richard G., to University Patents, Inc. Prevention of freezing at moderate supercooling using biogenic ice nucleation inhibitors. 4,601,842, Cl. 252-70.000.
Cardinal, John R., to Pfizer Inc. Laminate device for controlled and prolonged release of substances to an ambient environment and method of use. 4,601,893, Cl. 424-15.000.
Carganico, Germano: *See*—
Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, 4,602,022, Cl. 514-337.000.
Carl Still GmbH & Co. KG, Firma: *See*—
Dungs, Horst; Beckmann, Franz; and Birscheidt, Henri, 4,601,728, Cl. 44-10.00G.
Carlson, Curtis R., to RCA Corporation. Interpolated progressive-scan television display with line-crawl artifact filtration. 4,602,273, Cl. 358-11.000.
Carminati, Paolo: *See*—
Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,602,024, Cl. 514-357.000.
Carr, Lawrence J.; Nichols, George M.; and Rose, Selwyn H., to Borg-Warner Chemicals, Inc. Phosphazene based functional fluid compositions. 4,601,843, Cl. 252-78.500.
Carter, Nicholas J. R.: *See*—
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Casey, William T., Jr., to Milton Roy Company. Spectrophotometer. 4,601,582, Cl. 356-414.000.
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Murakami, Fumitune; and Saito, Katsumi, 4,602,369, Cl. 371-25.000.
Cassanova, Robert A.: *See*—
McGowan, Thomas F.; Tessner, R. Lynnard; Cassanova, Robert A.; and Bulpitt, William S., 4,601,730, Cl. 48-76.000.
Casso Solar Corporation: *See*—
Canfield, Douglas M., 4,601,743, Cl. 65-162.000.
Castagna, Joseph T., to International Business Machines Corporation. Damped coil construction for VCM. 4,602,175, Cl. 310-13.000.
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Klett, Gene R., 4,601,119, Cl. 37-141.00T.
Cavalli, Nicholas J., to FINIC, B.V. Environmental cut-off for deep excavations. 4,601,615, Cl. 405-267.000.
Cavazza, Claudio, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Salts of-carnitine and alkanoyl L-carnitines and process for preparing same. 4,602,039, Cl. 514-561.000.
Cavitt, Michael B.; and Duncan, David J., to Dow Chemical Company, The. Thermosettable epoxy resins with improved impact resistance. 4,602,070, Cl. 525-528.000.
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Cecchin, Giuliano; Guglielmi, Floriano; and Zerega, Francesco, to HIMONT Incorporated. Plastic copolymers of propylene with linear dienes having conjugated double-bonds and process for preparing same. 4,602,077, Cl. 526-339.000.
Central Plastics Company: *See*—
Ramsey, Russel G., 4,602,148, Cl. 219-535.000.
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Luckers, John, 4,601,658, Cl. 432-37.000.
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Chaloux, Paul N., Jr.; and Havas, Janos, to International Business Machines Corporation. Underlay surface modification to control resin glass polymerization. 4,601,913, Cl. 427-38.000.
Champale, Inc.: *See*—
Hahn, Richard, 4,601,158, Cl. 53-491.000.
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Chang, Shih-Chih, to United States of America, Energy. Valve and dash-pot assembly. 4,601,309, Cl. 137-514.000.
Chantler, Eric N.; Hutchinson, Francis G.; and Sharman, Deborah A., to Imperial Chemical Industries PLC. Contraceptive methods. 4,602,042, Cl. 514-635.000.
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West, Michael H.; and Nagel, Fritz J., 4,602,011, Cl. 514-187.000.
Chapman Envelopes Limited: *See*—
Deverell, Roy A., 4,601,688, Cl. 493-238.000.
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Chea, Ramon C. W., Jr., to ITT Corporation. Dual voltage source feed circuit configuration for a telephone line circuit. 4,602,130, Cl. 179-18.0FA.
Chen, Wei-Tzuoh, to United States of America, Veteran Affairs. Method for dialysis. 4,601,830, Cl. 210-647.000.
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Cheresnowsky, Michael J., to GTE Products Corporation. Process for purifying molybdenum trioxide. 4,601,890, Cl. 423-54.000.
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Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., 4,601,460, Cl. 266-216.000.
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Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,601,354, Cl. 175-46.000.
Miller, Stephen J., 4,601,996, Cl. 502-242.000.
Moore, Joseph E., 4,602,029, Cl. 514-390.000.
Rose, Allan F., 4,602,030, Cl. 514-399.000.
Chiarizzio, Samuel J.; and Russell, Kenneth W., to Dow Corning Wright. Femoral trial prosthesis/rasp assembly. 4,601,289, Cl. 128-305.000.
Chiba, Masahiro; Iwata, Kazuo; Nakousai, Tadayuki; Ogawa, Hiroko; and Ohba, Takashi, to Canon Kabushiki Kaisha. Recording liquid. 4,601,756, Cl. 106-22.000.
Chicago Metallic Corporation: *See*—
Dunn, James J.; and Borucki, John S., 4,601,153, Cl. 52-666.000.
Chikama, Toshio, to Machida Endoscope Co., Ltd. Endoscope with a memory shape alloy to control tube bending. 4,601,283, Cl. 128-4.000.
Chikuma, Isamu: *See*—
Miyoshi, Akihiko; Furutani, Shigeki; Chikuma, Isamu; and Shimada, Satoru, 4,601,357, Cl. 180-140.000.
Chilton, Moir E. Industrial safety pull hook. 4,601,505, Cl. 294-26.000.
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David, Agoston; Kovacs, Ferenc; and Pogany, Janos, 4,601,866, Cl. 264-109.000.
Chinone, Naoki: *See*—
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Konotsune, Shiro; Higashi, Hiromi; Wada, Masami; Maehara, Hiroshi; and Tsuji, Kazuyuki, 4,602,065, Cl. 525-326.500.
Choby, Edward J., to Westinghouse Electric Corp. Flail tube cutter. 4,601,223, Cl. 82-82.000.
Chou, David T.; Durden, John A.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. Novel pesticidal phenoxyphenyl and phenoxypyridyl benzoyl ureas and process for preparation. 4,602,109, Cl. 564-23.000.
Chou, Mau-Song; and Wohltman, Keith W., to Exxon Research and Engineering Co. Liquid phase oxidation of organic compounds to their hydroperoxides. 4,602,118, Cl. 568-570.000.
Christophe, Theophile; and Moatti, Jean-Claude, to Moatti, Georges. Filter fitted with a deblinding device. 4,601,826, Cl. 210-340.000.
Christy, Marcia E.: *See*—
Baldwin, John J.; Ponticello, Gerald S.; and Christy, Marcia E., 4,602,093, Cl. 548-336.000.
Chrysler Corporation: *See*—
Weismann, Peter H.; Cameron, Dugald; and Eastman, Richard E., 4,601,359, Cl. 180-233.000.
Chu, Pochen; and Yen, Jeffrey H., to Mobil Oil Corporation. Catalyst composition dewaxing of lubricating oils. 4,601,993, Cl. 502-66.000.
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Bauer, Sigrid, 4,601,973, Cl. 430-280.000.
Hilti, Bruno; and Mayer, Carl W., 4,601,853, Cl. 260-239.00R.
Hurter, Rudolf, 4,602,084, Cl. 534-641.000.
Kristiansen, Odd; and Drabek, Jozef, 4,602,021, Cl. 514-336.000.
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Moser, Hans, 4,601,745, Cl. 71-88.000.
Schafer, Paul; and Berendt, Hans-Ulrich, 4,602,055, Cl. 524-157.000.
Yokoyama, Naokata, 4,602,014, Cl. 514-215.000.

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Cincinnati Milacron Inc.: *See—*
Grone, Robert J., 4,601,775, Cl. 156-523.000.

Circello, Joseph C.; Wilhite. John E.; Shelly, William A.; and Riley, Morgan S., to Honeywell Information Systems Inc. Dual validity bit arrays. 4,602,368, Cl. 371-21.000.

Citizen Watch Co., Ltd.: *See—*
Togashi, Seigo; and Morokawa, Shigeru, 4,602,292, Cl. 358-241.000.

Clairol Incorporated: *See—*
Barns, Ileana D.; Kunz, Raymond W.; Montagnino, James G.; and Morrison, Herbert M., 4,602,146, Cl. 219-373.000.
Mack, William; and Santhouse, Daniel, 4,602,143, Cl. 219-225.000.
Wolfram, Leszek J.; and Albrecht, Linda, 4,601,299, Cl. 132-7.000.

Clarion Co., Ltd.: *See—*
Okamoto, Takeshi; Minagawa, Shoichi; and Niitsuma, Teruo, 4,602,183, Cl. 310-313.00B.

Clark, John R. G.; and Wade, Philip J., to ALH Systems Limited. Expansion joint. 4,601,604, Cl. 404-69.000.

Clark, Raymond N.; and Schmitz, Anthony N., to RCA Corporation. Coaxial LC phase-shifter for phase-controlled television broadcast switching circuit. 4,602,227, Cl. 333-109.000.

Clark, Sheldon L.; and Pajaujis, Frank P., to Frekote, Inc. Two-component mold release system and method. 4,602,060, Cl. 524-745.000.

Clark, William T., III. Hot wire cutting system. 4,601,224, Cl. 83-74.000.

Clecak, Nicholas J.; Grant, Barbara D.; Miller, Robert D.; Tompkins, Terry C.; and Willson, Carlton G., to International Business Machines Corporation. High contrast, high resolution deep ultraviolet lithographic resist composition with diazo carbonyl compound having alpha phosphoryl substitution. 4,601,969, Cl. 430-192.000.

Clegg, John E. Ultraviolet beam concentrator. 4,601,549, Cl. 350-432.000.

Clement, James W., to Bakron Corp. Rotary loop taker for lock-stitch sewing machine. 4,601,250, Cl. 112-184.000.

Clements, Richard J.: *See—*
Campbell, Colin T.; Clements, Richard J.; Robinson, John F.; and Waring, Alan J., 4,601,610, Cl. 405-188.000.

Clerc, Michel: *See—*
Barnabe, Jean-Pierre; Clerc, Michel; and Mouhot, Frederic, 4,601,215, Cl. 74-492.000.

Cluzel, John M.: *See—*
Sperry, Elmer A., III; and Cluzel, John M., 4,602,162, Cl. 250-436.000.

Cobb, R. Lynn: *See—*
Fodor, Lawrence M.; and Cobb, R. Lynn, 4,601,340, Cl. 166-294.000.

Codex Corporation: *See—*
Herman, Alexander; Bolt, Murray H.; and Scavezze, Daniel C., 4,602,364, Cl. 370-85.000.

Coe, David J., to U.S. Philips Corporation. High voltage guard ring with variable width shallow portion. 4,602,266, Cl. 357-20.000.

Coeckelberghs, Paul; and Depoorter, Willy, to Interox (Societe Anonyme). Appliance for the production of gaseous products by decomposition of liquids. 4,601,884, Cl. 422-113.000.

Coffey, Fred S.: *See—*
Stotler, David V.; and Coffey, Fred S., 4,601,741, Cl. 65-4.400.

Coggins, Dolphus L.; and Lindner, Walter E., to McDonnell Douglas Corporation. Process of recovering aluminum etchant. 4,601,780, Cl. 156-642.000.

Cohen, Abraham B.; and Webers, Vincent J., to Du Pont de Nemours, E. I., and Company. Dry photosensitive film containing crosslinked beads. 4,601,970, Cl. 430-258.000.

Cohen, Maurice. Aloin and aloe-emodin containing pesticides. 4,602,004, Cl. 514-23.000.

Coldren, Daniel R.; Davis, Wayne S.; and Fortuna, Jon A., to AMP Incorporated. Electrical connector and wire assembly method. 4,601,530, Cl. 339-103.00M.

Cole, James E.; and Sears, Norman H., to Gould Inc. Drip chamber. 4,601,712, Cl. 604-251.000.

Coleco Industries, Inc.: *See—*
Robertson, John C.; and Santarsiero, Paul S., 4,601,478, Cl. 280-1.130.

Coleman, David L., to ServiceMaster Industries, Inc. Disinfectant formulation. 4,601,954, Cl. 428-522.000.

Coleman, Richard D.: *See—*
Capes, Charles E.; Bennett, Adam J.; Coleman, Richard D.; and Thayer, William L., 4,601,729, Cl. 44-51.000.

Coleman, William M., III, to Dow Chemical Company, The. Method for preparing supported Ti^{III} catalysts. 4,601,994, Cl. 502-111.000.

Collette, Wayne N., to Continental Group, Inc., The. Controlled feed of stabilizing rod associated with controlled application of blowing gas. 4,601,865, Cl. 264-40.300.

Collina, Giancarlo; and Stefani, Giannico, to Honeywell Information Systems Italia. High quality printing method. 4,601,593, Cl. 400-121.000.

Collonges, Francois: *See—*
Bruet, Philippe; Berthelon, Jean-Jacques; and Collonges, Francois, 4,602,034, Cl. 514-456.000.

Colman, Michael E.; and Goeller, Robert E., to General Electric Company. Gas turbine engine component cooling system. 4,601,202, Cl. 73-431.000.

Colortronic Co., Ltd.: *See—*
Noguchi, Haruo, 4,601,114, Cl. 34-27.000.

Comercon, Jean L.: *See—*
Dumargue, Guy; and Comercon, Jean L., 4,601,422, Cl. 228-44.300.

Communications Satellite Corporation: *See—*
Inukai, Thomas, 4,602,375, Cl. 375-109.000.

Compagnie Industrielle de Mecanismes en abrege C.I.M.: *See—*
Bernard, Vincent, 4,601,500, Cl. 292-201.000.

Conoco Inc.: *See—*
Anderson, Ardis L.; and McConaghy, James R., Jr., 4,601,812, Cl. 208-410.000.

Continental Group, Inc., The: *See—*
Collette, Wayne N., 4,601,865, Cl. 264-40.300.
Harry, Ieuan L.; Krihsnakumar, Suppayan M.; Jolly, Walter R.; and Beck, Martin H., 4,601,869, Cl. 264-523.000.

Control Concepts Corporation: *See—*
Montague, Herbert R., 4,602,308, Cl. 361-91.000.

Cook, John E., to Canadian Fram Limited. System for combined EGR and idle speed control. 4,601,277, Cl. 123-571.000.

Cook, John W., to British Telecommunications. Impedance measurement in 4-wire to 2-wire converters. 4,602,338, Cl. 364-482.000.

Cook, Michael M., to Morton Thiokol, Inc. Antimicrobial adjustment technique. 4,601,831, Cl. 210-692.000.

Cook, Stuart A.; Mayer, John F.; Tucker, David W.; and Smith, William N., to GPG Products Corp. Action figure in which manipulation of one arm produces rotation of both legs about a vertical axis. 4,601,672, Cl. 446-330.000.

Cook, Terrence E. Washing apparatus. 4,601,080, Cl. 15-3.120.

Coon, Darryl D.; and Derkits, Gustav E., Jr., to University of Pittsburgh. Apparatus and method for detection of infrared radiation. 4,602,352, Cl. 365-114.000.

Cooper, David H.: *See—*
Arakawa, Satoshi; and Cooper, David H., 4,601,284, Cl. 128-6.000.

Cooper, James L., to Eastman Kodak Company. Process for the selective production of ketones. 4,602,116, Cl. 568-387.000.

Cooper, Richard: *See—*
Lewis, Paul A., 4,601,155, Cl. 53-176.000.

Cope, Richard L., to Eubanks Engineering Co. Wire insulation stripping apparatus. 4,601,093, Cl. 29-564.400.

Coppa, Anthony P., to General Electric Company. Truss structure and method of construction. 4,601,152, Cl. 52-637.000.

Cordeiro, Anthony W.: *See—*
Levine, Robert A.; Davis, Danny F.; and Cordeiro, Anthony W., 4,601,203, Cl. 73-432.00R.

Cordis Corporation: *See—*
Hooven, Michael D.; and Tremulis, William S., 4,601,724, Cl. 623-66.000.

Corea, William C.: *See—*
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,601,354, Cl. 175-46.000.

Corgnier, Luigi; Riolfo, Benedetto; and Guglielmo, Mario, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. System for spatially and temporally transposing data words arrayed in periodically recurring patterns. 4,602,283, Cl. 358-119.000.

Corica, John A. Portable bridging apparatus. 4,601,079, Cl. 14-2.400.

Corsi, Jeffrey: *See—*
Galle, James E.; Mares, Frank; Diamond, Steven E.; Corsi, Jeffrey; and Regina, Francis J., 4,601,859, Cl. 558-459.000.

Costelli, Ugo; Dotti, Giulio; and Moretti, Luciano, to Fiat Auto S.p.A. Hydraulic control apparatus and an automatic gear box for motor vehicles. 4,601,681, Cl. 474-28.000.

Cotter, Timothy W.: *See—*
Bugger, Robert O.; and Cotter, Timothy W., 4,601,620, Cl. 410-22.000.

Cotteret, Jean: *See—*
Grollier, Jean-Francois; Cotteret, Jean; Bugaut, Andree; and Genet, Alain, 4,601,726, Cl. 8-410.000.

Coutin, Pierre F.: *See—*
Duclos, Didier A.; and Coutin, Pierre F., 4,601,445, Cl. 244-137.00A.

Covey, Robert L.; Gale, Michael T.; Gorog, Istvan; and Beltz, John P., to RCA Corporation. Method and apparatus of determining the true edge length of a body. 4,601,581, Cl. 356-383.000.

Cox, Floyd E. Reversible auger drive kit for post hole digger. 4,601,348, Cl. 173-25.000.

Cox, James R. Analog signal translating system with automatic frequency selective signal gain adjustment. 4,602,337, Cl. 364-480.000.

Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, to Farmitalia Carlo Erba, S.p.A. N-imidazolyl derivatives of bicyclic compounds. 4,602,022, Cl. 514-337.000.

Crain, Kenny K., to International Minerals & Chemical Corp. Implant device. 4,601,699, Cl. 604-64.000.

Craycraft, Donald G.; and Pham, Giao N., to NCR Corporation. X-and-OR memory array. 4,602,354, Cl. 365-203.000.

Creanova AG: *See—*
Krawagna, Alois, 4,601,413, Cl. 222-498.000.

Crisafulli, Emilio; Frigerio, Marco; and Kan, Jean-Paul, to Sanofi. 2-piperazinopyrimidine salt and pharmaceutical compositions containing it. 4,602,015, Cl. 514-252.000.

Crisafulli, Emilio: *See—*
Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,602,024, Cl. 514-357.000.

Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. N-(phenoxyalkyl)imidazoles as selective inhibitors of the thromboxane synthetase enzyme and pharmaceutical compositions thereof. 4,602,016, Cl. 514-234.000.

Crowell Corporation, The: *See—*
Adelman, Herbert B., 4,601,157, Cl. 53-450.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Corgnier, Luigi; Riolfo, Benedetto; and Guglielmo, Mario, 4,602,283, Cl. 358-119.000.

Cubic Corporation: *See—*
Fisher, Harrold, 4,601,565, Cl. 354-293.000.

Cugnini, Aldo G.; Gravereaux, Daniel W.; and Stebbings, David W., to CBS Inc. Adaptive expanders for FM stereophonic broadcasting system utilizing companding of difference signal. 4,602,381, Cl. 381-13.000.

Cummins Atlantic, Inc.: *See—*
Gerlach, Fritz L., 4,601,086, Cl. 29-156.40R.

Cummins Engine Company, Inc.: *See—*
Wells, Larry; Gale, Nigel; and Baugh, J. Dan, 4,601,265, Cl. 123-41.280.

Curtis, John. Muzzle loading apparatus. 4,601,125, Cl. 42-90.000.

Curtis, John R., to Ulano Corporation. Water soluble photoinitiator benzophenone and thioxanthenone ethoxy-ether derivatives. 4,602,097, Cl. 549-27.000.

Cushing, Gary R.: *See—*
Parry, Curtis L.; and Cushing, Gary R., 4,601,156, Cl. 53-399.000.

Cutcher, Dennis R.: *See—*
Austin, Peter W.; and Cutcher, Dennis R., 4,601,457, Cl. 251-63.000.

Cycles Peugeot: *See—*
Barnabe, Jean-Pierre; Clerc, Michel; and Mouhot, Frederic, 4,601,215, Cl. 74-492.000.

Cyron, Theodor, to Interatom GmbH. High-temperature exhaust gas catalyst support body of sheet steel with a high aluminum content, and method for manufacturing same. 4,602,001, Cl. 502-439.000.

Daguano, Jose P. Mechanical carrier. 4,601,636, Cl. 414-733.000.

Dahlander, Lennart E. R.: *See—*
Arwidsson, Lars I.; and Dahlander, Lennart E. R., 4,601,480, Cl. 280-43.120.

Daimler-Benz AG: *See—*
Schoppel, Roman; Mordau, Manfred; and Burk, Gerhard, 4,601,510, Cl. 296-194.000.

Dainippon Screen Manufacturing Co., Ltd.: *See—*
Oka, Masahiko; and Nishida, Masami, 4,601,627, Cl. 414-225.000.
Yamada, Mitsuhiko, 4,602,294, Cl. 358-280.000.

Damco Testers, Inc.: *See—*
Miller, Ronnie F.; Dwyer, Arthur L.; Miller, Darwin A.; and Miller, Darwin L., 4,601,194, Cl. 73-40.700.

Damico, Frank M., to Thill, Inc. Support assembly for overbed table. 4,601,246, Cl. 108-144.000.

Damp, Stephen P.; Johnson, Harvey G.; and Neufeldt, Allen A., to Johnson Re-Cycling International Inc. Roadway surface reconditioning apparatus. 4,601,605, Cl. 404-95.000.

Damson, Eckart; Franke, Horst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, to Robert Bosch GmbH. Method of and device for regulating fuel-and-air mixture supplied to an internal combustion engine. 4,601,276, Cl. 123-489.000.

Dana Corporation: *See—*
Flotow, Richard A.; and Roth, Roger Z., 4,601,377, Cl. 192-110.00R.

Danby, Hal C.; and Beigler, Myron A., to Minnesota Mining and Manufacturing Company. Ear canal electrode. 4,601,294, Cl. 128-642.000.

D'Andrade, Bruce M. Wheel with extendable traction spikes and toy including same. 4,601,519, Cl. 301-45.000.

Danfoss A/S: *See—*
Johansson, Gustav A., 4,601,179, Cl. 62-475.000.

Dang, Hang T.: *See—*
Powers, John H.; and Dang, Hang T., 4,601,796, Cl. 204-33.000.

Danison, Carl L. Snare trap with tubular body. 4,601,128, Cl. 43-82.000.

Das, Santanu; Middleton, Francisco A.; and Carter, Nicholas J. R., to ITT Corporation. Expansion apparatus for use in communication systems. 4,602,363, Cl. 370-58.000.

Das, Santanu: *See—*
Hargrave, Franklin; Middleton, Francisco A.; and Das, Santanu, 4,602,362, Cl. 370-54.000.

D'Avello, Robert F.: *See—*
Vilmur, Richard J.; and D'Avello, Robert F., 4,602,218, Cl. 330-279.000.

David, Agoston; Kovacs, Ferenc; and Pogany, Janos, to Chinoin. Process for tablet production. 4,601,866, Cl. 264-109.000.

Davila, Xavier. Jacket with programmable lights. 4,602,191, Cl. 315-76.000.

Davis, Chales M., Jr.; and Davis, Robert M. Can-baling machine. 4,601,238, Cl. 100-45.000.

Davis, Curtis E. Rain gutter ladder support. 4,601,365, Cl. 182-230.000.

Davis, Danny F.: *See—*
Levine, Robert A.; Davis, Danny F.; and Cordeiro, Anthony W., 4,601,203, Cl. 73-432.00R.

Davis, James A.: *See—*
Kang, Jung W.; and Davis, James A., 4,602,054, Cl. 524-83.000.

Davis, Robert M.: *See—*
Davis, Chales M., Jr.; and Davis, Robert M., 4,601,238, Cl. 100-45.000.

Davis, Robert T.: *See—*
Byrd, James D.; and Davis, Robert T., 4,601,862, Cl. 264-3.100.

Davis, Wayne S.: *See—*
Coldren, Daniel R.; Davis, Wayne S.; and Fortuna, Jon A., 4,601,530, Cl. 339-103.00M.

Dayco Corporation: *See—*
Foster, Randy C., 4,601,683, Cl. 474-135.000.
Kleykamp, Donald L., 4,601,245, Cl. 105-377.000.

Deacon, Martin J.; Forrest, Geoffrey; and Rowe, Gavin B., to Lever Brothers Company. Article suitable for wiping surfaces. 4,601,938, Cl. 428-153.000.

De Aguirre-Otegui, Ignacio: *See—*
Lambert, Pierre M.; and De Aguirre-Otegui, Ignacio, 4,602,080, Cl. 528-67.000.

Dean, Robert; Reyner, Peter J.; and Hutchinson, Derek, to Mars Incorporated. Apparatus for checking the validity of coins. 4,601,380, Cl. 194-318.000.

Decker, Robert C.: *See—*
Mundschenk, Glenn R.; and Decker, Robert C., 4,602,202, Cl. 320-2.000.

Deere & Company: *See—*
Swales, Barton L.; and Boens, Richard L., 4,601,372, Cl. 192-67.00R.

deFreitas, Maxmilian J.: *See—*
Moore, Eugene R.; and deFreitas, Maxmilian J., 4,602,064, Cl. 525-316.000.

DeGree, David C.: *See—*
West, Roger A.; Humphrey, Dallas R; Bergquist, Carl R.; and DeGree, David C., 4,602,125, Cl. 174-138.00G.

Degussa Aktiengesellschaft: *See—*
Karrenbauer, Michael; and Kleemann, Axel, 4,602,096, Cl. 548-498.000.
Schuster, Rolf, 4,601,660, Cl. 432-239.000.

de Hair, Johannes T. W.; van Kemenade, Johannes T. C.; and Berns, Everhardus G., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,602,188, Cl. 313-487.000.

DeHoff, Ronald L. Process for stabilizing the viscosity of an epoxy resin-acid anhydride system during reaction and cure. 4,601,769, Cl. 156-169.000.

Delhaes, Johannes C., to Rubber- en Kunststoffabriek ENBI B. V. Endless belt, and roller system with such a belt. 4,601,685, Cl. 474-188.000.

DeMars, Robert. Huggable toy mechanism. 4,601,671, Cl. 446-330.000.

Demoute, Jean-Pierre: *See—*
Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, 4,602,038, Cl. 514-521.000.

Dempster, Philip T.: *See—*
Bond, Malcolm L.; and Dempster, Philip T., 4,601,468, Cl. 272-130.000.

Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; Enzenberg, Hartmut; and Isenberg, Andreas, to VEB Werk fuer Fernsehelektronik im VED Kombinat Mikroelektronik. Liquid crystal substances for the guest-host effect. 4,601,846, Cl. 252-299.100.

Deneke, Albert; and Pedersen, Kurt F. L., to Aktieselskabet Laur. Knudsen, Nordisk Elektricitets Selskab. Manual actuating device for enclosed electrical switches. 4,602,136, Cl. 200-50.00A.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Nabeta, Takeshi; and Hanahara, Isamu, 4,602,051, Cl. 523-137.000.

Dennis, David S.: *See—*
Fattic, Gerald T.; Dennis, David S.; and Ricketts, William J., 4,601,197, Cl. 73-117.300.

Dennison, Steven C.: *See—*
Atkinson, Roger F.; Dennison, Steven C.; Welch, William D., Jr.; and Jolly, Ronald L., 4,602,134, Cl. 179-175.10R.

Denz, Helmut, to Robert Bosch GmbH. Method and device for self-diagnosis of final setting members. 4,601,199, Cl. 73-118.000.

Depoorter, Willy: *See—*
Coeckelberghs, Paul; and Depoorter, Willy, 4,601,884, Cl. 422-113.000.

Derkits, Gustav E., Jr.: *See—*
Coon, Darryl D.; and Derkits, Gustav E., Jr., 4,602,352, Cl. 365-114.000.

Derleth, Helmut; Sauer, Guenther; and Bretz, Karl-Heinz, to Kali-Chemie Aktiengesellschaft. Product and process for the production of granules of high mechanical strength and containing molecular sieve. 4,601,992, Cl. 502-64.000.

DeSoto, Inc.: *See—*
Brown, Wallace H.; Ansel, Robert E.; and Murray, Kevin P., 4,601,757, Cl. 106-183.000.

Despres, Dominique; and Feigler, Jacques, to Valeo. Clutch with built-in travel limiting means. 4,601,373, Cl. 192-70.180.

Detroyat, Jean-Michel: *See—*
Ordines, Jean-Pierre; Bacot, Dominique; and Detroyat, Jean-Michel, 4,601,733, Cl. 55-139.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Polyphonic tone synthesizer with harmonic range selection. 4,601,229, Cl. 84-1.010.

Deutsche Babcock Werke Aktiengesellschaft: *See—*
Meier, Hans-Joachim; and Secker, Joachim, 4,601,734, Cl. 55-269.000.

Deverell, Roy A., to Chapman Envelopes Limited. Apparatus for producing envelope blanks. 4,601,688, Cl. 493-238.000.

Devlin, Charles L.: *See—*
Gordon, Richard S.; Devlin, Charles L.; and Durling, Mark W., 4,602,341, Cl. 364-494.000.

DeWolf, Lowell E.; Scrudato, James J.; and Wallace, Robert S., to DeWolf, Lowell E.; Scrudato, James J.; and Wallace, Robert S. Wrist watch or clock rosary device. 4,601,584, Cl. 368-10.000.

Diacel Chemical Industries, Ltd.: *See*—
Hiraishi, Masanori, 4,602,126, Cl. 178-18.000.
Diamond Communication Products, Inc.: *See*—
Leonardo, Ignazio, 4,601,451, Cl. 248-74.100.
Diamond, Craig J.: *See*—
Tegeler, John J.; Diamond, Craig J.; and Helsley, Grover C., 4,602,035, Cl. 514-469.000.
Diamond, Steven E.: *See*—
Galle, James E.; Mares, Frank; Diamond, Steven E.; Corsi, Jeffrey; and Regina, Francis J., 4,601,859, Cl. 558-459.000.
Dickinson, Roger P.: *See*—
Cross, Peter E.; and Dickinson, Roger P., 4,602,016, Cl. 514-234.000.
Diegelman, David. Camera and lens case. 4,601,318, Cl. 150-52.00J.
Diessel, Guenter: *See*—
Hesse, Konrad; and Diessel, Guenter, 4,601,169, Cl. 60-406.000.
Dietrich, Michael: *See*—
Dietrich, Wolfgang; and Dietrich, Michael, 4,602,181, Cl. 310-241.000.
Dietrich, Wolfgang; and Dietrich, Michael. Brush holder assembly for use in electric machines. 4,602,181, Cl. 310-241.000.
Dilgren, Richard E.; and Owens, Kenneth B., to Shell Oil Company. Process for selecting a steam foam forming surfactant. 4,601,336, Cl. 166-252.000.
Dillard, Ronald J.: *See*—
Allison, Alfred E.; and Dillard, Ronald J., 4,601,663, Cl. 434-33.000.
Dingwall, Andrew G. F., to RCA Corporation. Input current saving apparatus for flash A/D converter. 4,602,241, Cl. 340-347.0AD.
Dippold, Clemens: *See*—
Gebald, Georg; Rohrich, Heinz; Dippold, Clemens; and Forner, Siegfried, 4,601,133, Cl. 51-135.00R.
DiRegolo, Joseph A., to Tritec Industries, Inc. Liquid chemical dispensing system. 4,601,409, Cl. 222-1.000.
Dismon, Peter: *See*—
Weidenhaupt, Wolfgang; Wepner, Gunter; and Dismon, Peter, 4,601,165, Cl. 57-213.000.
Dittakavi, Ashok, to Texas Instruments Incorporated. Bar code information source and method for decoding same. 4,602,152, Cl. 235-463.000.
Divis, Richard T.: *See*—
Hart, C. Jack; Murray, Lawrence K.; Rogers, David L.; and Divis, Richard T., 4,601,892, Cl. 423-456.000.
Djurovich, Peter I.: *See*—
West, Robert C.; and Djurovich, Peter I., 4,602,050, Cl. 522-135.000.
Dohnomoto, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Composite material made from matrix metal reinforced with mixed amorphous alumina-silica fibers and mineral fibers. 4,601,956, Cl. 428-614.000.
Doinel, Gerard H. D., to Fichet Bauche. Safety lock. 4,601,184, Cl. 70-360.000.
Dokan, Pierre E. Strip to protect and seal bath tub corners. 4,601,149, Cl. 52-287.000.
Dolan, Michael J., to Norton Company. Process for fractional distillation. 4,601,739, Cl. 62-20.000.
Donaldson, Charles W., to General Electric Company. Fixture device. 4,601,110, Cl. 33-547.000.
Donnelly, Frank. Building structure expansion apparatus. 4,601,141, Cl. 52-126.600.
Dorfman, Walter, to Robinson, Roy S., a part interest. Variable reactive force exercise device. 4,602,373, Cl. 272-129.000.
Dorn, Friedrich-Wilhelm; Wolter, Manfred; and Heymer, Gero, to Hoechst Aktiengesellschaft. Apparatus for improving the degree of graphitization of carbon black, and its use. 4,601,887, Cl. 422-150.000.
Dornier GmbH: *See*—
Friedel, Franz; Fruhauf, Werner; Harms, Gunter; Heise, Georg; and Lukewille, Heinrich, 4,601,442, Cl. 244-3.240.
Dotti, Giulio: *See*—
Costelli, Ugo; Dotti, Giulio; and Moretti, Luciano, 4,601,681, Cl. 474-28.000.
Doty, John T. Tool for providing access to underground valve stems. 4,601,077, Cl. 7-138.000.
Doucet, Henri J.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, to Centre National de la Recherche Scientifique. Soft X-ray source with cylindrical plasma compression. 4,602,376, Cl. 378-119.000.
Doucet, Maurice; and Lamy, Pierre, to Techmire Ltee. Dual slide casting or molding machine. 4,601,323, Cl. 164-312.000.
Dougherty, Cathy W., to Dow Chemical Company, The. Roofing element and roof employing such element. 4,601,150, Cl. 52-309.120.
Dougherty, Roderick J., to MCC Powers. Supervisory and control system having dynamic significant change of values. 4,602,343, Cl. 364-505.000.
Dougherty, William E., Jr.; Greer, Stuart E.; Nestork, William J.; and Norris, William T., to International Business Machines Corporation. Personalizable masterslice substrate for semiconductor chips. 4,602,271, Cl. 357-80.000.
Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel: *See*—
van Overbruggen, Gerardus J. J., 4,601,411, Cl. 222-207.000.
Dow Chemical Company, The: *See*—
Cavitt, Michael B.; and Duncan, David J., 4,602,070, Cl. 525-528.000.
Coleman, William M., III, 4,601,994, Cl. 502-111.000.
Dougherty, Cathy W., 4,601,150, Cl. 52-309.120.
Graham, Stephen L.; and Kelly, Laura A., 4,602,058, Cl. 524-320.000.
Lancaster, Gerald M.; and Allen, James A., 4,601,948, Cl. 428-349.000.
Moore, Eugene R.; and deFreitas, Maxmilian J., 4,602,064, Cl. 525-316.000.
Regelman, Dale F., 4,602,049, Cl. 521-129.000.
Schuetz, James E., 4,602,066, Cl. 525-326.700.
Tasset, Emmett L., 4,602,110, Cl. 564-292.000.
van Rooden, Bernardus J. M. S.; and Martinez, Jose L. T., 4,602,059, Cl. 524-521.000.
Wallace, Leslie E.; Rokosz, Leo F.; and Stacy, Charles L., Jr., 4,602,072, Cl. 526-77.000.
Dow Corning Corporation: *See*—
Halm, Roland L.; Wilding, Oliver K., Jr.; and Zapp, Regie H., 4,602,101, Cl. 556-472.000.
Dow Corning Ltd.: *See*—
Fridd, Petrina F.; Taylor, Rosemary M.; and Hill, Michael P., 4,601,902, Cl. 424-70.000.
Joseph, Edward A.; and Trego, Brian R., 4,602,078, Cl. 528-34.000.
Dow Corning, S.A.: *See*—
Joseph, Edward A.; and Trego, Brian R., 4,602,078, Cl. 528-34.000.
Dow Corning Wright: *See*—
Chiarizzio, Samuel J.; and Russell, Kenneth W., 4,601,289, Cl. 128-305.000.
Dow, Robert L.: *See*—
Proctor, Paul W.; and Dow, Robert L., 4,601,761, Cl. 148-9.00R.
Dowell Schlumberger Incorporated: *See*—
Nelson, Erik B., 4,601,758, Cl. 106-90.000.
Doyle, Arthur F.; and Sklarski, Dennis J., to Essex Group, Inc. High density, moisture resistant mica cylinders. 4,601,931, Cl. 428-36.000.
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Drabek, Jozef: *See*—
Kristiansen, Odd; and Drabek, Jozef, 4,602,021, Cl. 514-336.000.
Drake, Charles A., to Phillips Petroleum Company. Dehydration of alcohols employing a carboxylic acid treated catalyst. 4,602,119, Cl. 585-640.000.
Drake, Donald J.: *See*—
Hawkins, William G.; Drake, Donald J.; and Campanelli, Michael R., 4,601,777, Cl. 156-626.000.
Draper, Robert; and Wolfe, Robert W., to Westinghouse Electric Corp. Method and apparatus for fluidized steam drying of low-rank coals. 4,601,113, Cl. 34-10.000.
Draper, Robert; and Wolfe, Robert W., to Westinghouse Electric Corp. Method and apparatus for steam drying of low-rank coals using a rotary cylindrical vessel. 4,601,115, Cl. 34-32.000.
Drazan, Pavel: *See*—
Pavlovsky, Rudolf; and Drazan, Pavel, 4,602,233, Cl. 335-258.000.
Drellich, Ronald H. Leg up strap. 4,601,161, Cl. 54-46.000.
Drent, Eit, to Shell Oil Company. Process for the preparation of alpha-haloalkyl esters. 4,602,105, Cl. 560-266.000.
Dreyer, Siegfried, to Veb Chemieanlagenbaukombinat Leipzig-Grimma. Flat-membrane separating arrangement. 4,601,824, Cl. 210-232.000.
DRG (UK) Limited: *See*—
Bowman, Kenneth A., 4,601,462, Cl. 270-12.000.
D'Silva, Themistocles D. J.: *See*—
Chou, David T.; Durden, John A.; and D'Silva, Themistocles D. J., 4,602,109, Cl. 564-23.000.
Du Be , D. Robert; and May, Lawrence A., to Minnesota Mining and Manufacturing Company. Dental mandrel and detachable abrasive disk. 4,601,661, Cl. 433-134.000.
Dubourcq, Hilaire H.: *See*—
Rosenthal, Roberts; and Dubourcq, Hilaire H., 4,601,390, Cl. 206-175.000.
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Dubren, Ronald D.; and Dubren, Patricia C., 4,601,473, Cl. 273-272.000.
Dubren, Ronald D.; and Dubren, Patricia C. Word forming game. 4,601,473, Cl. 273-272.000.
Duclos, Didier A.; and Coutin, Pierre F., to R. Alkan & Cie. Device for rapid fixing and removal of a loader to and from an aircraft carrying device. 4,601,445, Cl. 244-137.00A.
Dudill, Roger: *See*—
Riley, Eric K.; Dudill, Roger; and Young, Philip J., 4,601,655, Cl. 431-116.000.
Dudzik, Henryk, to Mardon Illingworth Ltd. Injection molded container. 4,601,406, Cl. 220-66.000.
Duke, Steven D. Beam and chain hoist for removing vehicle transmission. 4,601,360, Cl. 180-294.000.
Dumargue, Guy; and Comercon, Jean L., to Societe Nationale Industrielle et Aerospatiale. Device for forming and welding blanks in superplastic material. 4,601,422, Cl. 228-44.300.
Dunbar, F. Curtiss: *See*—
Retallick, William B.; and Dunbar, F. Curtiss, 4,601,999, Cl. 502-314.000.
Duncan, David J.: *See*—
Cavitt, Michael B.; and Duncan, David J., 4,602,070, Cl. 525-528.000.
Dungs, Horst; Beckmann, Franz; and Birscheidt, Henri, to Carl Still GmbH & Co. KG, Firma. Method and apparatus for preparing a material for hot briquetting. 4,601,728, Cl. 44-10.00G.
Dunn, James J.; and Borucki, John S., to Chicago Metallic Corporation. Suspended ceiling system. 4,601,153, Cl. 52-666.000.

Dunn, William H.: *See*—
Stier, Roger E.; Dunn, William H.; and Vidra, James D., 4,601,898, Cl. 424-52.000.
Stier, Roger E.; Dunn, William H.; and Vidra, James D., 4,601,899, Cl. 424-52.000.
Dunnavant, William R.; Gardikes, John J.; and Langer, Heimo J., to Ashland Oil, Inc. Phenolic resin-polyisocyanate binder systems containing a phosphorus based acid. 4,602,069, Cl. 525-504.000.
Duphar International Research B.V.: *See*—
Rappoldt, Menso P.; and Mos, Gerardus H. M., 4,601,855, Cl. 260-239.55C.
Dupin, Thierry; Caillod, Jacques; Leroux, Patrick; and Martino, Germain, to Societe Francaise des Produits pour Catalyse Pro-Catalyse. Process for manufacturing a catalyst on an alumina support and the catalyst produced by the process. 4,602,000, Cl. 502-335.000.
Du Pont de Nemours, E. I., and Company: *See*—
Buckfelder, John J.; and Schleinitz, Henry M., 4,601,827, Cl. 210-500.330.
Buser, Kenneth R.; and Rettig, Thomas A., 4,602,046, Cl. 521-46.000.
Cohen, Abraham B.; and Webers, Vincent J., 4,601,970, Cl. 430-258.000.
Gier, Thurman E.; Shannon, Robert D.; and Sonnichsen, George C., 4,602,112, Cl. 564-474.000.
Huybrechts, Jozef T.; Meeus, Ferdinand F.; and Timmerman, August T., 4,602,053, Cl. 523-436.000.
Lemke, Timothy A., 4,601,527, Cl. 339-14.00R.
Durand, John E. Centrifugal positive displacement device. 4,601,646, Cl. 418-153.000.
Duranleau, Roger G.; and Brennan, Michael E., to Texaco Inc. Catalytic process for the production of hydroxyamine derivatives of alpha methyl glucoside. 4,602,085, Cl. 536-17.200.
Durden, John A.: *See*—
Chou, David T.; Durden, John A.; and D'Silva, Themistocles D. J., 4,602,109, Cl. 564-23.000.
Durfee, David W., to Hydroacoustics, Inc. Welding of plastic parts. 4,601,927, Cl. 428-35.000.
Durfee, David W.: *See*—
Bouyoucos, John V.; and Durfee, David W., 4,601,768, Cl. 156-73.500.
Durling, Mark W.: *See*—
Gordon, Richard S.; Devlin, Charles L.; and Durling, Mark W., 4,602,341, Cl. 364-494.000.
Durrschnabel, Wolfgang; Stuer, Heinrich; Steeb, Jorg; and Puckert, Franz J., to Wieland-Werke AG. Copper-nickel-tin-titanium-alloy and a method for its manufacture. 4,601,879, Cl. 420-473.000.
Duschl, Robert A., to RCA Corporation. Electron beam intensity profile measuring system and method. 4,602,272, Cl. 358-10.000.
Dutra, Gerard A.: *See*—
Sikorski, James A.; Mischke, Deborah; and Dutra, Gerard A., 4,601,744, Cl. 671-86.000.
Du Vall, Gregory, to Teleflora, Inc. Retainer for attaching a flower container lid. 4,601,130, Cl. 47-41.120.
Dwyer, Arthur L.: *See*—
Miller, Ronnie F.; Dwyer, Arthur L.; Miller, Darwin A.; and Miller, Darwin L., 4,601,194, Cl. 73-40.700.
E. R. Squibb & Sons, Inc.: *See*—
Meyers, Edward; Liu, Wen-Chih; and Sykes, Richard B., 4,601,904, Cl. 424-118.000.
Thottathil, John K.; and Moniot, Jerome L., 4,602,092, Cl. 548-112.000.
Eason, Beatle. Apparatus for loading and storing boats. 4,601,606, Cl. 405-1.000.
Eastern Company, The: *See*—
Pastva, John V., 4,601,501, Cl. 292-218.000.
Eastman Kodak Company: *See*—
Cooper, James L., 4,602,116, Cl. 568-387.000.
Foster, Charles H., 4,602,098, Cl. 549-413.000.
Garris, Vladimir A., 4,601,569, Cl. 355-15.000.
Grashof, Hans R.; Kan, Hsin-Chia; Sandhu, M. Akram; Wright, John F.; and Yacobucci, Paul D., 4,601,966, Cl. 430-109.000.
Eastman, Richard E.: *See*—
Weismann, Peter H.; Cameron, Dugald; and Eastman, Richard E., 4,601,359, Cl. 180-233.000.
Eaton Corporation: *See*—
Calviello, Joseph A., 4,601,096, Cl. 29-571.000.
Eatwell, William D.: *See*—
Pringle, Ronald E.; and Eatwell, William D., 4,601,341, Cl. 166-321.000.
Ebata, Toshiki: *See*—
Kikuchi, Kenichi; Iiyama, Michitomo; Ebata, Toshiki; and Hayashi, Hideki, 4,601,095, Cl. 29-571.000.
Eberle, Manfred; and Hartmann, Rudolf-Peter, to Mantec Gesellschaft fur Automatisierungs- und Handhabungssysteme mbH. Industrial robot having individual electrical three-phase drives. 4,602,195, Cl. 318-568.000.
Ebert, Hildegard; and Kreutzfeldt, Richard, to Hoechst Aktiengesellschaft. Process for the preparation of penicillin-free mycelium masses from penicillin production cultures formed by fermentation, and their use as animal feeds and fertilizers. 4,601,908, Cl. 426-52.000.
Eckels, Phillip W.; and Heberlein, Joachim V. R., to Westinghouse Electric Corp. Homopolar generators with thermosyphons for improved cooling. 4,602,177, Cl. 310-57.000.
Ecklund, Lawrence M., to Motorola, Inc. Dual indicator circuit for tuning and stereo signals. 4,602,379, Cl. 381-12.000.
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., to National Research Development Corporation. Methods of producing image information from objects. 4,602,214, Cl. 324-309.000.
Eder, Ulrich: *See*—
Westermann, Jurgen; Boroschewski, Gerhard; Eder, Ulrich; Arndt, Friedrich; Krahmer, Hansjorg; and Kotter, Clemens, 4,601,746, Cl. 71-92.000.
Edwards, Charles W., to Westinghouse Electric Corp. PWM motor drive with torque determination. 4,602,201, Cl. 318-811.000.
Effland, Richard C.; and Pierrat, Frank A., to Hoechst-Roussel Pharmaceuticals, Inc. Antihypertensive 3-aryl-1,2-benzisoxazol-sulfonyl and sulfinylalkanoic acids. 4,602,028, Cl. 514-379.000.
Effron, Marc H.; and Tancredi, Henry J., to Cabot Medical Corporation. Surgical instrument for cutting body tissue from a body area having a restricted space. 4,601,290, Cl. 128-305.000.
Egyt Gyogyszevegyeszeti Gyar: *See*—
Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; and Benko, Pal, 4,602,018, Cl. 514-243.000.
Eisai Co., Ltd.: *See*—
Yamanaka, Motosuke; Saito, Isao; Yamatsu, Kiyomi; and Fujimoto, Takako, 4,602,031, Cl. 514-399.000.
Ejiri, Yuuki; Ito, Tomoo; and Kamifuji, Hiroshi, to Hitachi, Ltd. Throttle valve controlling apparatus. 4,601,271, Cl. 123-361.000.
El Paso Hydrocarbons Company: *See*—
Mehra, Yuv R., 4,601,738, Cl. 62-17.000.
Electric Power Research Institute, Inc.: *See*—
Zingler, Christian J., 4,601,326, Cl. 164-502.000.
Elektriciteit voor Goederenbehandeling Marine en Industrie, in het verkort: "Egemin", naamloze vennootschap: *See*—
Stoffelen, Eduardus, 4,601,200, Cl. 73-290.00V.
Eli Lilly and Company: *See*—
Hirsch, Kenneth S.; Jones, Charles D.; and Taylor, Harold M., 4,602,025, Cl. 514-359.000.
Schmiegel, Klaus K.; and Shaw, Walter N., 4,602,044, Cl. 514-653.000.
Ellis, Billy H.; and Ellis, Randall. Aluminum shingle accessories. 4,601,135, Cl. 52-58.000.
Ellis, Ernest W.: *See*—
Borror, Alan L.; Ellis, Ernest W.; and McGowan, Donald A., 4,602,263, Cl. 346-201.000.
Ellis, Randall: *See*—
Ellis, Billy H.; and Ellis, Randall, 4,601,135, Cl. 52-58.000.
Ellis, William L., Sr. Mobile kitchen and cafeteria unit. 4,601,509, Cl. 296-22.000.
Eltro GmbH: *See*—
Karning, Heinrich; Raubinger, Gerhard; and Weigel, Wolfgang, 4,601,540, Cl. 350-266.000.
Elworthy, Trevor P.: *See*—
Pipkin, Noel J.; and Elworthy, Trevor P., 4,601,423, Cl. 228-121.000.
Emerson Electric Co.: *See*—
Baker, Gerald N., 4,602,176, Cl. 310-51.000.
Emori & Co. Ltd.: *See*—
Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, 4,601,911, Cl. 427-34.000.
Emory University: *See*—
Patonay, Gabor; Warner, Isiah M.; and Oldham, Philip B., 4,602,193, Cl. 315-170.000.
Endo, Hiroshi; Matsui, Hiroshi; and Suzuki, Takanori, to Yuka Badische Co., Ltd. Process for producing foamed particles of polyolefin resin. 4,602,047, Cl. 521-58.000.
Endotherapeutics Corporation: *See*—
Moll, Frederic H., 4,601,710, Cl. 604-165.000.
Endres, Dan D.: *See*—
Sigl, Wayne C.; Endres, Dan D.; and Habert, Christine C., 4,601,065, Cl. 2-49.00R.
Engelhard Corporation: *See*—
Speronello, Barry K., 4,601,997, Cl. 502-263.000.
Engelhardt, Ernst; and Kolbl, Georg, to Balwin - Gegenheimer GmbH. Apparatus for ascertaining and/or keeping constant the mixing ratio of a liquid mixture. 4,601,306, Cl. 137-91.000.
Engelsberger, Herbert, to Feldmuhle Aktiengesellschaft. Carrier film backed with composite film. 4,601,930, Cl. 428-36.000.
Enoki, Sigekazu: *See*—
Suzuki, Akira; Kobayashi, Kazuo; and Enoki, Sigekazu, 4,601,967, Cl. 430-107.000.
Enomoto, Seiji: *See*—
Nozaki, Shigeki; Takemae, Yoshihiro; and Enomoto, Seiji, 4,602,356, Cl. 365-230.000.
Ensco, Inc.: *See*—
Yang, Ta-Lun; and Broome, Paul, 4,602,245, Cl. 340-384.00R.
Yang, Ta-Lun; and Broome, Paul, 4,602,357, Cl. 367-93.000.
Enzenberg, Hartmut: *See*—
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; Enzenberg, Hartmut; and Isenberg, Andreas, 4,601,846, Cl. 252-299.100.
Eriksson, Hans, to Swed Sorb Corporation AB. Filter for separating off liquids of high viscosity. 4,601,825, Cl. 210-287.000.
Eriksson, Sune: *See*—
Santen, Sven; Feinman, Jerome; and Eriksson, Sune, 4,601,752, Cl. 75-10.220.
Erk, Gayyur; and Korlatzki, Rudi, to Naturin-Werk Becker & Company. Single-layer elastic tubular film of polyamide used for packaging paste substances and a process for the production of such film. 4,601,929, Cl. 428-36.000.
Ernst, Richard J.; Peterson, Francis C.; and Sledz, Melissa L., to Illinois Tool Works Inc. Self drilling threaded insert for drywall. 4,601,625, Cl. 411-387.000.

Erpo Mobelerke W. Blauw GmbH & Co.: *See—*
Welsch, Bertram; and Blauw, Gunther, 4,601,074, Cl. 5-47.000.

Esanu, Andre , to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.). 6-aminomethyl-furo-(3,4-c)-pyridine derivatives and therapeutic compositions containing the same. 4,602,020, Cl. 514-302.000.

Escher W GmbH: *See—*
Pellhammer, Maurus; and Siewert, Wolfgang, 4,601,819, Cl. 209-273.000.

Esposito, Joseph, to Four Seasons Solar Products Corp. Method and framework for a greenhouse or the like including a reversible gable adaptor. 4,601,139, Cl. 52-90.000.

Esselte Pendaflex Corporation: *See—*
Solomon, Jack, 4,601,398, Cl. 211-46.000.

Essex Group, Inc.: *See—*
Doyle, Arthur F.; and Sklarski, Dennis J., 4,601,931, Cl. 428-36.000.
Doyle, Arthur F.; and Sklarski, Dennis J., 4,601,952, Cl. 428-454.000.
Zaman, Mohammad F.; and Peppler, Dennis L., 4,601,918, Cl. 427-120.000.

Ethyl Corporation: *See—*
McKinnie, Bonnie G., 4,602,108, Cl. 564-2.000.
McKinnie, Bonnie G.; and Ranken, Paul F., 4,602,113, Cl. 568-54.000.
Penton, Harold R.; and Pettigrew, F. Alexander, 4,602,048, Cl. 521-82.000.

Eubanks Engineering Co.: *See—*
Cope, Richard L., 4,601,093, Cl. 29-564.400.

Eumann, Hanns-Heinz; and Blank, Winfried, to Eumann, Hanns-Heinz. Apparatus for desalting water by electrodialysis. 4,601,808, Cl. 204-301.000.

Evankow, Joseph D., Jr., to United States of America, Army. Semiconductor multipactor device. 4,602,190, Cl. 315-39.630.

Evans Marine, Inc.: *See—*
Jarrett, Mark, 4,601,488, Cl. 280-810.000.

Evans, Robert W., to Hughes Tool Company. Thermal slide joint. 4,601,333, Cl. 166-115.000.

Everett, Peter G., to Zenith Electronics Corporation. Intermediate frequency saw filter with nyquist phase modulation correction. 4,602,288, Cl. 358-197.000.

Excellon Industries: *See—*
Roberts, William E.; and Nelson, Alfred M., 4,601,382, Cl. 198-432.000.

Exploration Logging, Inc.: *See—*
More, Henry S.; and Koch, Christopher E., 4,601,100, Cl. 29-885.000.

Extraversion, Inc.: *See—*
Ytter, Willy, 4,601,524, Cl. 312-114.000.

Exxon Research and Engineering Co.: *See—*
Chou, Mau-Song; and Wohltman, Keith W., 4,602,118, Cl. 568-570.000.
Luton, Michael J., 4,601,650, Cl. 425-79.000.

Fa. Diehl GmbH & Co.: *See—*
Meisner, Alfred, 4,601,589, Cl. 374-208.000.

Fabrica d'Armi P.Beretta S.p.A.: *See—*
Beretta, Pier G., 4,601,122, Cl. 42-21.000.

Fadner, Thomas A., to Rockwell International Corporation. Copper and ceramic composite ink metering roller. 4,601,242, Cl. 101-348.000.

Fagerlund, Bertil K. E., to Beloit Corporation. Method of bringing a digester up to cooking temperature. 4,601,787, Cl. 162-45.000.

Fallon, David E., to Harvey Hubbell Incorporated. Fiber optic cable grip. 4,601,507, Cl. 294-86.420.

Fannin, Michael L.: *See—*
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., 4,602,129, Cl. 179-18.00B.

Fanuc Ltd.: *See—*
Inaba, Yoshiharu, 4,601,653, Cl. 425-587.000.
Matsui, Mitsuo, 4,602,196, Cl. 318-603.000.

Farley, Brent L. Time display system. 4,601,585, Cl. 368-80.000.

Farmer, Jerry R.: *See—*
Trevathan, Larry C.; and Farmer, Jerry R., 4,601,427, Cl. 239-11.000.

Farmitalia Carlo Erba, S.p.A.: *See—*
Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, 4,602,022, Cl. 514-337.000.

Fasang, Patrick P.; and Shen, John P., to General Electric Company. Multiplexed-access scan testable integrated circuit. 4,602,210, Cl. 324-73.00R.

Fattic, Gerald T.; Dennis, David S.; and Ricketts, William J., to General Motors Corporation. Peak combustion pressure timing detector for internal combustion engine. 4,601,197, Cl. 73-117.300.

Federal-Mogul Corporation: *See—*
Ladin, Eli M., 4,601,374, Cl. 192-85.0CA.

Fehn, Gregory M.: *See—*
Jabarin, Saleh A.; and Fehn, Gregory M., 4,601,926, Cl. 428-35.000.

Fehr, Peter: *See—*
Stratil, Tomas; Pisinger, Milos; and Fehr, Peter, 4,601,763, Cl. 148-23.000.

Feick, Walter B., to RCA Corporation. Structure and method for interconnecting printed circuit boards. 4,602,316, Cl. 361-412.000.

Feigler, Jacques: *See—*
Despres, Dominique; and Feigler, Jacques, 4,601,373, Cl. 192-70.180.

Feinman, Jerome: *See—*
Santen, Sven; Feinman, Jerome; and Eriksson, Sune, 4,601,752, Cl. 75-10.220.

Feinmechanische Werke Mainz GmbH: *See—*
Hesse, Konrad; and Diessel, Guenter, 4,601,169, Cl. 60-406.000.

Feldmuhle Aktiengesellschaft: *See—*
Engelsberger, Herbert, 4,601,930, Cl. 428-36.000.

Fenster, Raynard M. Apparatus and method for dissipating and discharging electrostatic charges. 4,602,310, Cl. 361-212.000.

Ferag AG: *See—*
Honegger, Werner, 4,601,436, Cl. 242-59.000.

Ferez Industries, Inc.: *See—*
Ferez, Marcio C., 4,601,482, Cl. 280-265.000.

Ferez, Marcio C., to Ferez Industries, Inc. Self propelled wagon. 4,601,482, Cl. 280-265.000.

Ferranti plc: *See—*
Watson, Norman F., 4,601,206, Cl. 73-514.000.

Ferretti, Michael D.; Gabel, Brian L.; and Horton, James A., to Air Products and Chemicals, Inc. Method and system for measurement of liquid level in a tank. 4,602,344, Cl. 364-509.000.

Ferro Corporation: *See—*
Kammann, Karl P., Jr.; and Wagner, Terrence L., 4,601,838, Cl. 252-49.300.

Fertell, Paul A.; McCartney, John; and Robbiati, Giandaniele, to Steon Company. Impregnation of leather with polyurethane dispersions. 4,601,951, Cl. 428-423.400.

F'Geppert, Erwin, to United States of America, Army. Hoist. 4,601,633, Cl. 414-546.000.

Fiat Auto S.p.A.: *See—*
Costelli, Ugo; Dotti, Giulio; and Moretti, Luciano, 4,601,681, Cl. 474-28.000.

Fiat Trattori, S.p.A.: *See—*
Gregorio, Angelo, 4,601,346, Cl. 172-7.000.

Fichet Bauche: *See—*
Doinel, Gerard H. D., 4,601,184, Cl. 70-360.000.

Fidel, Howard F.; and Greenwood, David L., to Johnson & Johnson Ultrasound, Inc. Steerable Doppler transducer probes. 4,601,292, Cl. 128-660.000.

Fiege, Robert K. Explosive evaporation motor. 4,601,170, Cl. 60-513.000.

Figge, Dieter: *See—*
Artz, Gerd; Beckmann, Gerhard; Figge, Dieter; and Philipp, Clemens, 4,601,324, Cl. 164-432.000.

Fijiwara, Keiji; Shinoda, Takaaki; Kitou, Shigehiro; and Kawabe, Suenobu, to Kabushikigaisha Takuma. Dynamic gas filter apparatus. 4,601,736, Cl. 55-479.000.

Filtertek, Inc.: *See—*
Leason, Hayden, 4,601,820, Cl. 210-94.000.

Finch, Christopher M.: *See—*
Pepi, John W.; and Finch, Christopher M., 4,601,553, Cl. 350-611.000.

Finegold, Leonard S.; and Freymuth, Christopher A., to United Technologies Corporation. Gate array with reduced isolation. 4,602,270, Cl. 357-42.000.

Finger, Ulrich; Ligneres, Pierre; and O'Donnell, Ciaran, to L'Etat Francais represente par le Ministre des P.T.T. (Centre National d'Etudes des Telecommunications); and Institut National de Recherche en Informatique et en Automatique. Management system for the memory of a processor or microprocessor. 4,602,328, Cl. 364-200.000.

FINIC, B.V.: *See—*
Cavalli, Nicholas J., 4,601,615, Cl. 405-267.000.

Finkle, Mark A.; and Fishman, James D., to Unmanned Solutions, Inc. Method and apparatus for folding polymeric sheet material and flexible disk jackets made thereby. 4,601,689, Cl. 493-251.000.

Finn, William A.; and Searfass, Harry I., to Asten Group Inc. Laminated soft faced-spiral woven papermakers fabric. 4,601,942, Cl. 428-222.000.

Fiore, Fred W., Jr.; and Fiore, Lee B., Jr. Woman's bare midriff garment. 4,601,069, Cl. 2-106.000.

Fiore, Lee B., Jr.: *See—*
Fiore, Fred W., Jr.; and Fiore, Lee B., Jr., 4,601,069, Cl. 2-106.000.

Fiquet, Line L.: *See—*
Vinches, Gerard; and Fiquet, Line L., 4,602,079, Cl. 528-60.000.

Firestone Tire & Rubber Company, The: *See—*
Kang, Jung W.; and Davis, James A., 4,602,054, Cl. 524-83.000.

Fischer, Arwed W. Padded knit fabric, particularly for lingerie, and method of its manufacture. 4,601,940, Cl. 428-178.000.

Fischer, Robert T., to Miner Enterprises, Inc. Operating system for railroad hopper car gate assembly doors. 4,601,244, Cl. 105-240.000.

Fischman, Martin; and Gallaro, Anthony V., to North American Philips Consumer Electronics Corp. Color CRT with composite arc suppression structure. 4,602,187, Cl. 313-479.000.

Fisher, Harrold, to Cubic Corporation. Camera adapter device. 4,601,565, Cl. 354-293.000.

Fishman, James D.: *See—*
Finkle, Mark A.; and Fishman, James D., 4,601,689, Cl. 493-251.000.

Fisons plc: *See—*
Kamm, Kevin L., 4,601,696, Cl. 494-10.000.

Fitzwater, Margaret; and Keller, Lewis C., to Frito-Lay, Inc. Food product with opposite phase-shifted corrugations of the same frequency and amplitude and method and apparatus of manufacture. 4,601,227, Cl. 83-403.000.

Fives-Cail Babcock: *See—*
Henin, Jean-Pierre; and Niel, Philippe, 4,601,657, Cl. 432-14.000.

FL Industries, Inc.: *See*—
Shelby, Billy L.; and Wirt, James R., 4,602,236, Cl. 336-216.000.

Flachenecker, Gerhard: *See*—
Lindenmeier, Heinz; Flachenecker, Gerhard; and Hopf, Jochen, 4,602,260, Cl. 343-701.000.

Flake, Clark J.: *See*—
Zehler, Eugene R.; and Flake, Clark J., 4,601,840, Cl. 252-56.00S.

Fling, Russell T.; Willis, Donald H.; and McNeely, David L., to RCA Corporation. Digital signal level overload system. 4,602,276, Cl. 358-27.000.

Flotow, Richard A.; and Roth, Roger Z., to Dana Corporation. Clutch adjustment method. 4,601,377, Cl. 192-110.00R.

FMC Corporation: *See*—
Wittman, Leroy L.; and Olsen, David W., 4,601,401, Cl. 212-180.000.

Fockens, Pieter, to Zenith Electronics Corporation. Intermediate frequency filter with Nyquist phase modulation correction. 4,602,287, Cl. 358-197.000.

Fodor, Lawrence M.; and Cobb, R. Lynn, to Phillips Petroleum Company. Aluminum citrate solution. 4,601,340, Cl. 166-294.000.

Fondedile S.p.A.: *See*—
Wolf, Chitis, 4,601,613, Cl. 405-239.000.

Ford Motor Company: *See*—
Meitzler, Allen H., 4,602,184, Cl. 310-322.000.

Forester, David R.; and Barlow, Raymon C., to Betz Laboratories, Inc. Passivation of FCC catalysts. 4,601,815, Cl. 208-120.000.

Forner, Siegfried: *See*—
Gebald, Georg; Rohrich, Heinz; Dippold, Clemens; and Forner, Siegfried, 4,601,133, Cl. 51-135.00R.

Forrest, Geoffrey: *See*—
Deacon, Martin J.; Forrest, Geoffrey; and Rowe, Gavin B., 4,601,938, Cl. 428-153.000.

Fortuna, Jon A.: *See*—
Coldren, Daniel R.; Davis, Wayne S.; and Fortuna, Jon A., 4,601,530, Cl. 339-103.00M.

Foster, Charles H., to Eastman Kodak Company. Process for separation of tocopherol homologues (I). 4,602,098, Cl. 549-413.000.

Foster, Harold L.: *See*—
Foster, Michael L.; Foster, Harold L.; and Powers, Michael A., 4,602,248, Cl. 340-601.000.

Foster, Michael L.; Foster, Harold L.; and Powers, Michael A. Electrical atmospheric pressure alarm. 4,602,248, Cl. 340-601.000.

Foster, Randy C., to Dayco Corporation. Belt tensioner, part therefor and methods of making the same. 4,601,683, Cl. 474-135.000.

Foster, Stuart L.; and Stillman, Gerald T., to Sensormedics Corporation. Temperature control system for cutaneous gas monitor. 4,601,293, Cl. 128-635.000.

Foulke, Richard F., to Proconics International, Inc. Rolling apparatus. 4,601,521, Cl. 384-54.000.

Four Seasons Solar Products Corp.: *See*—
Esposito, Joseph, 4,601,139, Cl. 52-90.000.

Fournot, Bernard; Le Bozec, Francois; and Rouland, Daniel, to Rouland, Daniel; and Gaz de France. Apparatus with means of self-displacement for its advance within a duct, in particular for remote inspection and/or treatment and/or tubing of said duct. 4,601,204, Cl. 73-432.00R.

Foxboro Company, The: *See*—
Kraus, Thomas W., 4,602,326, Cl. 364-158.000.

France, John W. Trash bag loading device for garden carts and the like. 4,601,315, Cl. 141-231.000.

Franchino, Giovanni: *See*—
Berutto, Eugenio; Franchino, Giovanni; and Sella, Lino, 4,602,138, Cl. 200-340.000.

Frank, Alan. Random number generator. 4,601,471, Cl. 273-144.00B.

Franke, Horst: *See*—
Damson, Eckart; Franke, Horst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,601,276, Cl. 123-489.000.

Frasch, Carl, to United States of America, Health and Human Services. Vaccine against *Neisseria meningitidis* Group B serotype 2 invasive disease. 4,601,903, Cl. 424-92.000.

Frechette, Doris. Nursing garment. 4,601,068, Cl. 2-104.000.

Freeman, Michael J., to ACTV, Inc. Method for providing targeted profile interactive CATV displays. 4,602,279, Cl. 358-86.000.

Frekote, Inc.: *See*—
Clark, Sheldon L.; and Pajaujis, Frank P., 4,602,060, Cl. 524-745.000.

Frelund, Arthur R., to General Motors Corporation. Engine combustion chamber pressure sensor. 4,601,196, Cl. 73-115.000.

Frenkel, Richard E.: *See*—
Schwartz, Allan E.; and Frenkel, Richard E., 4,601,598, Cl. 401-6.000.

Freundlich, Glen G., to AT&T Information Systems Inc. Automatic redialing arrangement for multi-line telephone station sets. 4,602,128, Cl. 179-10.000.

Freymuth, Christopher A.: *See*—
Finegold, Leonard S.; and Freymuth, Christopher A., 4,602,270, Cl. 357-42.000.

Fricker, Robert: *See*—
Schiltknecht, Bruno; Arnold, Gebhard; Kagi, Otto; Fricker, Robert; and Troxler, Beat, 4,601,416, Cl. 222-600.000.

Fridd, Petrina F.; Taylor, Rosemary M.; and Hill, Michael P., to Dow Corning Ltd. Compositions and process for treating hair. 4,601,902, Cl. 424-70.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Artz, Gerd; Beckmann, Gerhard; Figge, Dieter; and Philipp, Clemens, 4,601,324, Cl. 164-432.000.

Friedel, Franz; Fruhauf, Werner; Harms, Gunter; Heise, Georg; and Lukewille, Heinrich, to Dornier GmbH. Missile with highly backswept wing unit, in particular with delta wings. 4,601,442, Cl. 244-3.240.

Friedrich, Ralph S.: *See*—
Ulrich, Ronald G.; and Friedrich, Ralph S., 4,601,496, Cl. 285-156.000.
Ulrich, Ronald G.; and Friedrich, Ralph S., 4,601,770, Cl. 156-171.000.

Frigerio, Marco: *See*—
Crisafulli, Emilio; Frigerio, Marco; and Kan, Jean-Paul, 4,602,015, Cl. 514-252.000.

Frito-Lay, Inc.: *See*—
Fitzwater, Margaret; and Keller, Lewis C., 4,601,227, Cl. 83-403.000.

Froberger, Charles F.; and Spearot, James A., to General Motors Corporation. Electric field oil filter and method of filtering. 4,601,799, Cl. 204-181.800.

Froehlich, Peter: *See*—
Lang, Gusztav; Leibhard, Erich; and Froehlich, Peter, 4,601,192, Cl. 72-377.000.

Frommelt Industries, Inc.: *See*—
Frommelt, Robert J., 4,601,142, Cl. 52-173.0DS.

Frommelt, Robert J., to Frommelt Industries, Inc. Loading dock shelters. 4,601,142, Cl. 52-173.0DS.

Fruhauf, Werner: *See*—
Friedel, Franz; Fruhauf, Werner; Harms, Gunter; Heise, Georg; and Lukewille, Heinrich, 4,601,442, Cl. 244-3.240.

Frye, David E. Cloth stitching apparatus and method. 4,601,249, Cl. 112-121.140.

Fuchs, Helmut, to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft. Apparatus for making a yarn. 4,601,167, Cl. 57-401.000.

Fuerst, Charles O.: *See*—
Sherman, Robert M.; and Fuerst, Charles O., 4,601,821, Cl. 210-169.000.

Fujawa, Charles S.; and Argyelan, David J., to Allied Corporation. Digital control system. 4,602,324, Cl. 364-130.000.

Fuji Electric Company, Ltd.: *See*—
Watanabe, Yasuo; Takahashi, Takeo; and Haga, Keiji, 4,601,431, Cl. 241-172.000.

Fuji Heavy Industries, Ltd.: *See*—
Teraoka, Masao; and Kobayashi, Toshio, 4,601,217, Cl. 74-701.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Nagai, Masaaki, 4,601,272, Cl. 123-425.000.

Fuji Photo Film Co., Ltd.: *See*—
Arai, Yoshihiro; and Shirahata, Ryuji, 4,601,912, Cl. 427-35.000.
Asai, Eiichi; Komaki, Takao; and Adachi, Yuma, 4,602,156, Cl. 250-327.200.
Iida, Shinobu; Yamaguchi, Nobutaka; Tsukuda, Fumiaki; Fujiyama, Masaaki; and Tadokoro, Eiichi, 4,601,946, Cl. 428-323.000.
Karino, Yukio, 4,601,976, Cl. 430-496.000.
Kita, Nobuyuki; Matsumoto, Hiroshi; and Imai, Masanori, 4,601,974, Cl. 430-309.000.
Kondo, Ryuji; and Tisue, J. Gilbert, 4,602,290, Cl. 358-213.000.
Mitsuo, Hirofumi; and Saeki, Keiso, 4,601,920, Cl. 427-150.000.
Murakoshi, Makoto, 4,602,296, Cl. 360-10.100.
Ohta, Takahiro, 4,601,546, Cl. 350-339.00F.
Taniguchi, Yutaka, 4,602,154, Cl. 250-227.000.
Utsugi, Mikio, 4,601,573, Cl. 355-75.000.
Yamashita, Yoshimi, 4,601,561, Cl. 354-149.110.

Fuji Photo Optical Co., Ltd.: *See*—
Arakawa, Satoshi; and Cooper, David H., 4,601,284, Cl. 128-6.000.
Numata, Saburo, 4,602,194, Cl. 315-241.00P.

Fujieda, Yasuhiko: *See*—
Amano, Itaru; Kurumaji, Masanobu; Misumi, Shikao; Fujieda, Yasuhiko; and Kanzawa, Masahide, 4,601,648, Cl. 425-47.000.

Fujii, Tadaomi; Kitazawa, Koji; Tomono, Yutaka; Takagi, Tomio; and Kawachi, Josuke, to Hitachi Zosen Corporation. Press sintering process for green compacts and apparatus therefor. 4,601,877, Cl. 419-42.000.

Fujikura, Yoshiaki; Takaishi, Naotake; and Inamoto, Yoshiaki, to Kao Corporation. Process for producing trycyclo[5.2.1.$0^{2,6}$]decane-2-carboxylic acid. 4,602,107, Cl. 562-499.000.

Fujimori, Hiroyoshi: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,602,281, Cl. 358-98.000.

Fujimoto, Takako: *See*—
Yamanaka, Motosuke; Saito, Isao; Yamatsu, Kiyomi; and Fujimoto, Takako, 4,602,031, Cl. 514-399.000.

Fujimoto, Terunori; Nakagawa, Yasuhiko; Baba, Toshio; Moriyama, Hirokazu; Miyachi, Akio; and Inui, Tsuneo, to Toyo Kohan Co., Ltd. Method for producing a thin tin and nickel plated steel sheet for welded can material. 4,601,957, Cl. 428-622.000.

Fujimura, Setsuo: *See*—
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 4,601,875, Cl. 419-23.000.
Yamashita, Michio; and Fujimura, Setsuo, 4,601,876, Cl. 419-23.000.

Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Hydroxyalkoxy norbornyl ethers, process for preparing same and organoleptic uses thereof. 4,601,835, Cl. 252-8.900.

Fujisaka, Teijiro: *See*—
Tsuda, Tetsuaki; Asano, Kazuo; Shibuya, Atsuyoshi; Nishihara, Minoru; Yanagi, Kenichi; Kato, Mitsuo; Yamada, Katsuhiko; and Fujisaka, Teijiro, 4,601,794, Cl. 204-15.000.

Fujita, Hirotsugu: *See*—
Asami, Yoshiaki; Suzuki, Shintaro; Fujita, Hirotsugu; and Homma, Fumiko, 4,601,919, Cl. 427-126.300.
Fujita, Masami: *See*—
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Fujita, Takeshi: *See*—
Meguro, Kanji; and Fujita, Takeshi, 4,602,027, Cl. 514-374.000.
Fujitsu Limited: *See*—
Aihara, Satoshi; and Tanizawa, Tetsu, 4,602,339, Cl. 364-490.000.
Nozaki, Shigeki; Takemae, Yoshihiro; and Enomoto, Seiji, 4,602,356, Cl. 365-230.000.
Shirato, Takehide, 4,602,267, Cl. 357-35.000.
Shoji, Toyoshige; and Miyakawa, Tatsuo, 4,601,083, Cl. 17-54.000.
Fujiwara, Shinsuke, to NEC Home Electronics, Ltd. Dot line printer. 4,601,241, Cl. 101-93.040.
Fujiyama, Masaaki: *See*—
Iida, Shinobu; Yamaguchi, Nobutaka; Tsukuda, Fumiaki; Fujiyama, Masaaki; and Tadokoro, Eiichi, 4,601,946, Cl. 428-323.000.
Fukuchi, Hisashi, to Toyota Jidosha Kabushiki Kaisha. Gear-shift mechanism for manual transmission. 4,601,214, Cl. 74-477.000.
Fukuda, Shuzo; Ohkubo, Yutaka; Ishii, Toshio; Sagiyama, Masaru; and Tonouchi, Akira, to Nippon Kokan Kabushiki Kaisha. Vertical type electro-galvanizing apparatus. 4,601,801, Cl. 204-206.000.
Fukui, George M.; Spencer, Herbert J.; and Williams, Laurens R., II, to Abbott Laboratories. Salicylate culture media for inactivation of bacterial growth inhibitors. 4,602,007, Cl. 514-159.000.
Fultz, Jack, to Pertec Peripherals Corporation. Servo pattern for dedicated surface track following servo systems. 4,602,304, Cl. 360-77.000.
Funatsu, Takenori: *See*—
Furubayashi, Toshio; Funatsu, Takenori; Inuzuka, Yoichi; Aihara, Osamu; and Hayashi, Mikio, 4,601,759, Cl. 106-308.00M.
Fuqua, Clark R., to Genus Catheter Technologies, Inc. Variable diameter catheter. 4,601,713, Cl. 604-280.000.
Furchak, John G. Mechanism and coupling process for lifting the tailgate of a pick-up truck when coupling with fifth wheel vehicles. 4,601,485, Cl. 280-423.00R.
Furtek, Edward J., to Vitronics Corporation. Infrared panel emitter and method of producing the same. 4,602,238, Cl. 338-236.000.
Furtlehner, Jean-Pierre: *See*—
Doucet, Henri J.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,602,376, Cl. 378-119.000.
Furubayashi, Toshio; Funatsu, Takenori; Inuzuka, Yoichi; Aihara, Osamu; and Hayashi, Mikio, to Toyo Ink Manufacturing Co., Ltd. Pigment compositions, method for producing same, and colored resin compositions. 4,601,759, Cl. 106-308.00M.
Furukawa, Koichi: *See*—
Aiba, Masahiko; and Furukawa, Koichi, 4,601,595, Cl. 400-637.000.
Furutani, Shigeki: *See*—
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G.D Societa' per Azioni: *See*—
Mattei, Riccardo; and Belvederi, Bruno, 4,601,297, Cl. 131-109.100.
GA Technologies Inc.: *See*—
Purcell, John R.; and Hsu, Yen-hwa, 4,602,231, Cl. 335-216.000.
Gabbay, Moses A.; and Oum, Sang O., to Boston Acoustics, Inc. Electro-acoustic transducer assembly. 4,602,382, Cl. 381-90.000.
Gabel, Brian L.: *See*—
Ferretti, Michael D.; Gabel, Brian L.; and Horton, James A., 4,602,344, Cl. 364-509.000.
Gal, Pal. Process for the manufacture of heat-exchanger elements of strip-finned heat-exchangers. 4,601,089, Cl. 29-157.30V.
Galbraith, Lee K., to Tencor Instruments. Light collector for optical contaminant and flaw detector. 4,601,576, Cl. 356-237.000.
Gale, Michael T.: *See*—
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Gale, Nigel: *See*—
Wells, Larry; Gale, Nigel; and Baugh, J. Dan, 4,601,265, Cl. 123-41.280.
Gallaher, Donald D., to Weyerhaeuser Company. Machine for manufacture of H-divider containers having improved compression resistance. 4,601,687, Cl. 493-89.000.
Gallaro, Anthony V.: *See*—
Fischman, Martin; and Gallaro, Anthony V., 4,602,187, Cl. 313-479.000.
Galle, James E.; Mares, Frank; Diamond, Steven E.; Corsi, Jeffrey; and Regina, Francis J., to Allied Corporation. Selective hydrogenation of aliphatic dinitriles to omega-aminonitriles in ammonia with supported, finely dispersed rhodium-containing catalyst. 4,601,859, Cl. 558-459.000.
Galler, Jeffrey M. Method of restoring posterior teeth with interproximal decay, and kit of armamentarium therefor. 4,601,662, Cl. 433-226.000.
Gamble, Johnny R.: *See*—
McGill, Kenneth E.; and Gamble, Johnny R., 4,601,891, Cl. 423-305.000.
Gannaway, Edwin L., to Tecumseh Products Company. Main bearing for a rotary compressor. 4,601,644, Cl. 417-363.000.
Gannon, Mark A.: *See*—
Yester, Francis R., Jr.; and Gannon, Mark A., 4,602,229, Cl. 333-208.000.
Garcia, Sonny Q.: *See*—
O'Keefe, William F.; and Garcia, Sonny Q., 4,601,143, Cl. 52-171.000.
Gardikes, John J.: *See*—
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Garrard Products Limited: *See*—
Wren, John P., 4,601,362, Cl. 181-208.000.
Garrett Corporation, The: *See*—
Wright, E. Scott, 4,601,591, Cl. 384-536.000.
Garris, Vladimir A., to Eastman Kodak Company. Apparatus for cleaning a photoconductor. 4,601,569, Cl. 355-15.000.
Garritano, Ronald F., to Rheometrics, Inc. Apparatus and method for measuring viscoelastic properties of materials. 4,601,195, Cl. 73-60.000.
Gaspar, Luis M.: *See*—
Goeb, Robert; and Gaspar, Luis M., 4,602,223, Cl. 332-9.00R.
Gati, George S.; Lee, Albert P.; Schwartz, Geraldine C.; and Standley, Charles L., to International Business Machines Corporation. Composite insulator structure. 4,601,939, Cl. 428-161.000.
Gaude, Maurice, to La Telemecanique Electrique. Control circuit for a bistable solenoid. 4,602,309, Cl. 361-210.000.
Gavaletz, Eugene J.: *See*—
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Gaz de France: *See*—
Fournot, Bernard; Le Bozec, Francois; and Rouland, Daniel, 4,601,204, Cl. 73-432.00R.
Gazaix, Michel: *See*—
Doucet, Henri J.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,602,376, Cl. 378-119.000.
Gdula, Robert A.: *See*—
Bianchi, Jacqueline K.; Gdula, Robert A.; and Lange, Dennis J., 4,601,782, Cl. 156-643.000.
Geary, David F.; Schinner, Edward N.; and Shriver, George R., to Baltimore Aircoil Company, Inc. V-belt drive system for corrosive atmospheres. 4,601,684, Cl. 474-144.000.
Gebald, Georg; Rohrich, Heinz; Dippold, Clemens; and Forner, Siegfried, to Kraftwerk Union Aktiengesellschaft. Manipulator head with grinding device for pipes or pipelines. 4,601,133, Cl. 51-135.00R.
Gebruder Kommerling Kunststoffwerke GmbH: *See*—
Haffer, Dieter, 4,601,953, Cl. 428-457.000.
GEC Avionics Limited: *See*—
Brown, George, 4,602,336, Cl. 364-456.000.
Geho, W. Blair, to Technology Unlimited Inc. Treatment for hypoglycemia. 4,602,043, Cl. 514-646.000.
Gell, Harold A. Roasting timer. 4,602,147, Cl. 219-509.000.
GenCorp Inc.: *See*—
Metcalf, Fredric D.; and Sommer, John G., 4,601,935, Cl. 428-57.000.
Genelin, Gregory U. Apparatus for eliciting responses by animals to moving, visually discernible stimuli. 4,601,261, Cl. 119-29.000.
Genentech Inc.: *See*—
Goeddel, David V.; and Heyneker, Herbert L., 4,601,980, Cl. 435-70.000.
General Dynamics, Pomona Division: *See*—
Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., 4,601,493, Cl. 285-53.000.
General Electric Company: *See*—
Colman, Michael E.; and Goeller, Robert E., 4,601,202, Cl. 73-431.000.
Coppa, Anthony P., 4,601,152, Cl. 52-637.000.
Donaldson, Charles W., 4,601,110, Cl. 33-547.000.
Fasang, Patrick P.; and Shen, John P., 4,602,210, Cl. 324-73.00R.
Gordon, Richard S.; Devlin, Charles L.; and Durling, Mark W., 4,602,341, Cl. 364-494.000.
Kelman, Arnold L.; Prendergast, John F.; Stevens, Edward P.; and Lang, George R., 4,602,378, Cl. 378-26.000.
Losapio, Peter F.; and Germer, Warren R., 4,602,211, Cl. 324-103.00R.
Mitchell, Tyrone D., 4,602,094, Cl. 548-406.000.
Mundschenk, Glenn R.; and Decker, Robert C., 4,602,202, Cl. 320-2.000.
Olson, Hjalmar A., 4,602,180, Cl. 310-215.000.
Perkins, William C.; and Whang, Keh-Wen, 4,602,240, Cl. 340-310.00R.
Shannon, Thomas G.; and Brunelle, Daniel J., 4,601,858, Cl. 558-281.000.
Soileau, Trasimond A.; and Speaker, Lawrence W., 4,601,753, Cl. 75-251.000.
Soileau, Trasimond A.; and Speaker, Lawrence W., 4,601,765, Cl. 148-104.000.
Vatis, Dimitrios, 4,602,226, Cl. 332-31.00R.
Walker, Loren H., 4,602,199, Cl. 318-798.000.
Walker, Loren H., 4,602,200, Cl. 318-798.000.
Walker, Loren H., 4,602,206, Cl. 323-211.000.
Weiss, Herbert W.; and Walker, Loren H., 4,602,198, Cl. 318-798.000.
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General Foods Corporation: *See*—
Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., 4,602,095, Cl. 548-532.000.
General Motors Corporation: *See*—
Fattic, Gerald T.; Dennis, David S.; and Ricketts, William J., 4,601,197, Cl. 73-117.300.
Frelund, Arthur R., 4,601,196, Cl. 73-115.000.

Froberger, Charles F.; and Spearot, James A., 4,601,799, Cl. 204-181.800.
Ghavamikia, Hamid, 4,601,936, Cl. 428-119.000.
LeBlanc, Richard S., 4,601,230, Cl. 89-1.200.
Lee, Hsai-Yin, 4,601,921, Cl. 427-240.000.
Martell, William A.; and Weiss, Ladislaus, 4,601,867, Cl. 264-227.000.
Tiwari, Basant L.; and Howie, Blake J., 4,601,810, Cl. 204-413.000.
Weinand, Louis H., 4,601,275, Cl. 123-468.000.

Genet, Alain: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Bugaut, Andree; and Genet, Alain, 4,601,726, Cl. 8-410.000.

Genus Catheter Technologies, Inc.: *See*—
Fuqua, Clark R., 4,601,713, Cl. 604-280.000.

Geo Vann, Inc.: *See*—
George, Flint R., 4,601,492, Cl. 285-3.000.

Georg Fischer AG: *See*—
Brandenberger, Urs; Henych, Ivo; Hornung, Klaus; and Menk, Werner, 4,601,751, Cl. 75-130.00R.

George F. Valassis & Company: *See*—
Brandon, David A., 4,601,490, Cl. 283-56.000.

George, Flint R., to Geo Vann, Inc. Releasable coupling. 4,601,492, Cl. 285-3.000.

Georgia Tech Research Corporation: *See*—
McGowan, Thomas F.; Tessner, R. Lynnard; Cassanova, Robert A.; and Bulpitt, William S., 4,601,730, Cl. 48-76.000.

Georgopoulos, George, to Levolor Lorentzen, Inc. Installation hardware for venetian blind in a van window frame. 4,601,319, Cl. 160-178.00B.

Gerbig, Fred T. Air filter system for clean room. 4,601,737, Cl. 55-493.000.

Gergen, William P.: *See*—
Lutz, Robert G.; and Gergen, William P., 4,601,941, Cl. 428-213.000.

Gerlach, Fritz L., to Cummins Atlantic, Inc. Method of manufacturing top stop-type fuel injector. 4,601,086, Cl. 29-156.40R.

Germer, Warren R.: *See*—
Losapio, Peter F.; and Germer, Warren R., 4,602,211, Cl. 324-103.00R.

Gero, Gary: *See*—
Bogle, Robert W.; Gero, Gary; and Wald, Stephen L., 4,601,557, Cl. 352-140.000.

Gershoni, Jonathan M., to Yale University. Transfer of macromolecules from a chromatographic substrate to an immobilizing matrix. 4,601,828, Cl. 210-635.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Bohle, Werner, 4,601,218, Cl. 74-785.000.

Ghandehari, Mohammad H., to Union Oil Company of California. Rare earth-containing magnets. 4,601,754, Cl. 75-252.000.

Ghavamikia, Hamid, to General Motors Corporation. Glass fiber mat reinforced plastic panels without the fiber readout defect. 4,601,936, Cl. 428-119.000.

Ghose, Sanjoy, to Seagate Technology. Magnetic disc memory apparatus incorporating temperature compensation. 4,602,305, Cl. 360-97.000.

Gibbs, Richard; Reynolds, Robert J.; and Greenhaw, Kevin. Ventilated fabric cover for stringed instruments. 4,601,391, Cl. 206-314.000.

Giebel, Gerhard, to USM Corporation. Adhesive applicator device in a cement lasting machine. 4,601,257, Cl. 118-411.000.

Gier, Thurman E.; Shannon, Robert D.; and Sonnichsen, George C., to Du Pont de Nemours, E. I., and Company. Zeolite H-ZK-5 as catalyst for conversion of methanol and ammonia to dimethylamine. 4,602,112, Cl. 564-474.000.

Giger, Rudolf K. A., to Sandoz Ltd. Dibenz[cd,f]indole derivatives, their preparation and pharmaceutical compositions containing them. 4,602,032, Cl. 514-410.000.

Gilbert, Seymour G.: *See*—
Vieth, Wolf R.; Wang, Shaw S.; and Gilbert, Seymour G., 4,601,981, Cl. 435-94.000.

Gill, William A., to Babcock Power Limited. Tool head assembly. 4,601,222, Cl. 82-4.00C.

Gillard, David F., to MacMillan Bloedel Limited. Multi-layered container. 4,601,407, Cl. 220-443.000.

Glanzmann, Edward J. Steering wheel device. 4,601,182, Cl. 70-252.000.

Glaxo Group Limited: *See*—
Weingarten, Gordon G., 4,602,012, Cl. 514-202.000.

Global Gym & Fitness Equipment Limited: *See*—
Lais, Edgar H., 4,601,466, Cl. 272-118.000.

Globus, Alfred R. Treatment of hazardous materials. 4,601,817, Cl. 208-262.000.

Goeb, Robert; and Gaspar, Luis M., to ITT Corporation. High rate modulator/demodulator for digital signals amplitude modulated on digital data. 4,602,223, Cl. 332-9.00R.

Goeddel, David V.; and Heyneker, Herbert L., to Genentech Inc. Microbial expression of a gene for human growth hormone. 4,601,980, Cl. 435-70.000.

Goel, Anil B., to Ashland Oil, Inc. Organo tin catalysts modified with bicyclic amide acetals. 4,601,995, Cl. 502-155.000.

Goeller, Robert E.: *See*—
Colman, Michael E.; and Goeller, Robert E., 4,601,202, Cl. 73-431.000.

Gordon, Richard S.; Devlin, Charles L.; and Durling, Mark W., to General Electric Company. Shared data logger controller and method. 4,602,341, Cl. 364-494.000.

Gordon, William R.: *See*—
White, William J.; Ortolf, James M.; and Gordon, William R., 4,601,526, Cl. 339-17.0CF.

Gore, Albert N., III; Lynch, Robert C.; McAdams, Ronald P.; and Shekita, Gregory A., to International Business Machines Corp. Radiation shield system. 4,602,164, Cl. 307-91.000.

Gorog, Istvan: *See*—
Covey, Robert L.; Gale, Michael T.; Gorog, Istvan; and Beltz, John P., 4,601,581, Cl. 356-383.000.

Goto, Hidetaka; and Nakamura, Tetsuo, to Matsuya Hoseikiki Hanbai Kabushiki Kaisha. Cloth gripping device. 4,601,463, Cl. 271-19.000.

Gotoh, Toshio: *See*—
Moriyama, Yoshiaki; Gotoh, Toshio; and Hayashi, Hideki, 4,602,295, Cl. 358-343.000.

Gotou, Yukihiro; and Suzuki, Etsuji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for detecting defects in a pattern. 4,601,577, Cl. 356-237.000.

Gottlieb, Milton; and Wachtel, Anselm, to Westinghouse Electric Corp. Acousto-optic tunable filter. 4,602,342, Cl. 364-498.000.

Gould Inc.: *See*—
Cole, James E.; and Sears, Norman H., 4,601,712, Cl. 604-251.000.

GPG Products Corp.: *See*—
Cook, Stuart A.; Mayer, John F.; Tucker, David W.; and Smith, William N., 4,601,672, Cl. 446-330.000.

Graham, Stephen L.; and Kelly, Laura A., to Dow Chemical Company, The. Compatibility and stability of blends of polyamide and ethylene copolymers. 4,602,058, Cl. 524-320.000.

Grant, Barbara D.: *See*—
Clecak, Nicholas J.; Grant, Barbara D.; Miller, Robert D.; Tompkins, Terry C.; and Willson, Carlton G., 4,601,969, Cl. 430-192.000.

Grashof, Hans R.; Kan, Hsin-Chia; Sandhu, M. Akram; Wright, John F.; and Yacobucci, Paul D., to Eastman Kodak Company. Dry, electrographic developer compositions containing polyester-amide toner particles. 4,601,966, Cl. 430-109.000.

Gravereaux, Daniel W.: *See*—
Cugnini, Aldo G.; Gravereaux, Daniel W.; and Stebbings, David W., 4,602,381, Cl. 381-13.000.

Gray, Bruce A.: *See*—
Robak, Casimir B.; Ramsey, Everett M.; Beil, Gary A.; and Gray, Bruce A., 4,601,750, Cl. 75-65.00R.

Gray, Joseph H., to TRW Inc. Data reordering memory for use in prime factor transform. 4,602,350, Cl. 364-900.000.

Greenhaw, Kevin: *See*—
Gibbs, Richard; Reynolds, Robert J.; and Greenhaw, Kevin, 4,601,391, Cl. 206-314.000.

Greenwell, Joseph D., to R. A. Jones & Co. Inc. Carton feeder. 4,601,691, Cl. 493-313.000.

Greenwood, David L.: *See*—
Fidel, Howard F.; and Greenwood, David L., 4,601,292, Cl. 128-660.000.

Greer, Stuart E.: *See*—
Dougherty, William E., Jr.; Greer, Stuart E.; Nestork, William J.; and Norris, William T., 4,602,271, Cl. 357-80.000.

Gregorio, Angelo, to Fiat Trattori, S.p.A. Unit connected to a tractor for raising and lowering an agricultural implement. 4,601,346, Cl. 172-7.000.

Gregory, Barry W., to J. T. Slocomb Co. Electrochemical machining technique and apparatus. 4,601,803, Cl. 204-224.00M.

Gregory, Jane A.: *See*—
Aviles, Henry E.; and Gregory, Jane A., 4,601,637, Cl. 414-739.000.

Grimes, Thomas L.; Roeland, Robert; and Schadewald, Frederic H., to Upjohn Company, The. Apparatus for internally electropolishing tubes. 4,601,802, Cl. 204-212.000.

Grimm, Rainer; and Bohm, Horst, to Rockwell-Golde G.m.b.H. Method of and apparatus for the height adjustment and installation of a sliding and/or raisable roof member to be fitted into an automobile. 4,601,091, Cl. 29-423.000.

Grisham, William H. Method of satellite operation using synthetic aperture radar addition holography for imaging. 4,602,257, Cl. 343-5.0CM.

Grollier, Jean-Francois; Cotteret, Jean; Bugaut, Andree; and Genet, Alain, to L'Oreal. Dye composition for the direct dyeing of keratinic fibres, containing at least one N-substituted cosolubilized 2-nitroparaphenylenediamine and corresponding processes for dyeing keratinic fibres. 4,601,726, Cl. 8-410.000.

Grone, Robert J., to Cincinnati Milacron Inc. Compliant presser member for composite tape laying machine. 4,601,775, Cl. 156-523.000.

Grosbois, Jean: *See*—
Jacubert, Serge; Grosbois, Jean; and Verdier, Jean-Michel, 4,601,798, Cl. 204-61.000.

Gross, Richard A.: *See*—
Allen, Donald E.; Gross, Richard A.; and Knuth, Howard D., 4,601,915, Cl. 427-96.000.

Gruber, Hermann: *See*—
Wellner, Wolfgang; Pedain, Josef; and Gruber, Hermann, 4,602,071, Cl. 525-528.000.

Gruzensky, Terrell. Wrist pocket process. 4,601,418, Cl. 224-222.000.

GTE Communication Systems Corporation: *See*—
Rovnyak, Richard M.; and Traina, Anthony, 4,602,317, Cl. 361-413.000.

GTE Laboratories Incorporated: *See*—
Regan, Robert J.; Butler, Scott J.; and Ben-Aharon, Zvi, 4,602,221, Cl. 331-117.00R.

GTE Lenkurt Incorporated: *See*—
O'Neill, John F., 4,602,133, Cl. 179-170.200.

GTE Products Corporation: *See—*
Cheresnowsky, Michael J., 4,601,890, Cl. 423-54.000.

Guazzo, Lucien, to Les Cables de Lyon. Connection for a submerged optical fiber cable. 4,601,536, Cl. 350-96.200.

Guerin, Jacky, to Societe de Dietrich. Pyrolytic self-cleaning domestic oven with improved means for protecting electronic panel and controls from heat damages. 4,601,279, Cl. 126-21.00A.

Guglielmi, Floriano: *See—*
Cecchin, Giuliano; Guglielmi, Floriano; and Zerega, Francesco, 4,602,077, Cl. 526-339.000.

Guglielmo, Mario: *See—*
Corgnier, Luigi; Riolfo, Benedetto; and Guglielmo, Mario, 4,602,283, Cl. 358-119.000.

Guichard, Jacques. Permanent color correction process using a sampling and an average color determination and a system using this process. 4,602,277, Cl. 358-29.000.

Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, to Societe Anonyme dite: L'Oreal. Anhydrous nail lacquer containing as a resin a copolymer comprising units of vinylsulfonamide or a unsaturated amide and of an alkyl acrylate or methacrylate. 4,601,901, Cl. 424-61.000.

Guitaut, Francois P.; and Cazenave, Claude M., to Sateba International S.A. Method of fixing a rail on a support of timber or cast or moulded material. 4,601,092, Cl. 29-456.000.

Gula, John A.: *See—*
Thompson, Thomas C.; Gula, John A.; and Meyer, Jack E., 4,601,700, Cl. 604-65.000.

Gunderson, Wayne D.: *See—*
Bartz, Stephen A.; and Gunderson, Wayne D., 4,601,570, Cl. 355-27.000.

Gunneman, Paul, to Sulzer-Ruti Machinery Work, Ltd. Method and apparatus for operating a weaving machine. 4,601,314, Cl. 139-429.000.

Gunter, James C., to Robertshaw Controls Company. Leakproof joint construction and apparatus for making the same. 4,601,090, Cl. 29-243.500.

Gvoich, William; and Rogers, John B. Valve module and apparatus therefor. 4,601,467, Cl. 272-130.000.

Habermann, Wolfgang: *See—*
Weiss, Franz-Josef; Habermann, Wolfgang; Hammes, Peter; Ritz, Josef; Thomas, Erwin; and Thoma, Peter, 4,601,800, Cl. 204-182.400.

Habert, Christine C.: *See—*
Sigl, Wayne C.; Endres, Dan D.; and Habert, Christine C., 4,601,065, Cl. 2-49.00R.

Haffer, Dieter, to Gebruder Kommerling Kunststoffwerke GmbH. Rolling shutter bar. 4,601,953, Cl. 428-457.000.

Haga, Keiji: *See—*
Watanabe, Yasuo; Takahashi, Takeo; and Haga, Keiji, 4,601,431, Cl. 241-172.000.

Hague, Colin: *See—*
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Hahn-Meitner-Institut fur Kernforschung Berlin GmbH: *See—*
Menezes, Shalini; Lewerenz, Hans-Joachim; and Bachmann, Klaus, 4,601,960, Cl. 429-111.000.

Hahn, Richard, to Champale, Inc. Container flap folding apparatus and method. 4,601,158, Cl. 53-491.000.

Hajos, Gyorgy: *See—*
Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; and Benko, Pal, 4,602,018, Cl. 514-243.000.

Halliwell, Neil A., to University of Southampton. Measurement of oscillatory and vibrational motion. 4,601,580, Cl. 356-349.000.

Hallmark Cards, Inc.: *See—*
Birkes, Stephen; Hill, Donna L.; and Pfahl, Kurt, 4,601,924, Cl. 428-7.000.

Halm, Roland L.; Wilding, Oliver K., Jr.; and Zapp, Regie H., to Dow Corning Corporation. Method of manufacturing alkylhalosilanes. 4,602,101, Cl. 556-472.000.

Hamaguchi, Iwao, to Ricoh Company, Ltd. Ballast resistor device for use in a laser system. 4,602,237, Cl. 338-20.000.

Hamamatsu Photonics Kabushiki Kaisha: *See—*
Kurono, Takehiro; Tsuchiya, Yutaka; Inuzuka, Eiji; and Hiruma, Teruo, 4,602,282, Cl. 358-110.000.

Hamilton, Edward R., to Rainhart Company. Automatic compactor. 4,601,352, Cl. 173-124.000.

Hammann, Ingeborg: *See—*
Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,602,033, Cl. 514-452.000.

Hammes, Peter: *See—*
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Hampton, Wade J. Prefabricated archway. 4,601,138, Cl. 52-86.000.

Hanahara, Isamu: *See—*
Nabeta, Takeshi; and Hanahara, Isamu, 4,602,051, Cl. 523-137.000.

Hanck, Alfred; and Pauling, Horst, to Hoffmann-La Roche Inc. Panthenol derivatives. 4,602,036, Cl. 514-494.000.

Hanna, Gayda; and Vadino, Winston A., to Schering Corporation. Controlled release dosage form comprising acetaminophen, pseudoephedrine sulfate and dexbrompheniramine maleate. 4,601,894, Cl. 424-19.000.

Hans Kolbe & Co.: *See—*
Lindenmeier, Heinz; Flachenecker, Gerhard; and Hopf, Jochen, 4,602,260, Cl. 343-701.000.

Harata, Tatsuo: *See—*
Mizutani, Yutaka; Harata, Tatsuo; and Tanahashi, Naokatsu, 4,602,074, Cl. 526-245.000.

Hargrave, Franklin; Middleton, Francisco A.; and Das, Santanu, to ITT Corporation. Information transport system. 4,602,362, Cl. 370-54.000.

Harms, Gunter: *See—*
Friedel, Franz; Fruhauf, Werner; Harms, Gunter; Heise, Georg; and Lukewille, Heinrich, 4,601,442, Cl. 244-3.240.

Harper, J. Cletus, to PPG Industries, Inc. Spring tensioned wire resistance heater. 4,602,239, Cl. 338-316.000.

Harris Graphics Corporation: *See—*
Richey, Jarold L., 4,601,693, Cl. 493-370.000.

Harris, Harold L. Noise and emission control apparatus. 4,601,168, Cl. 60-299.000.

Harris, Richard T.: *See—*
Harris, Theodore R.; and Harris, Richard T., 4,601,363, Cl. 181-280.000.

Harris, Theodore R.; and Harris, Richard T. Large diesel engine exhaust muffler. 4,601,363, Cl. 181-280.000.

Harry, Ieuan L.; Krihsnakumar, Suppayan M.; Jolly, Walter R.; and Beck, Martin H., to Continental Group, Inc., The. Blow molding method employing a mold clamp assembly. 4,601,869, Cl. 264-523.000.

Hart, C. Jack; Murray, Lawrence K.; Rogers, David L.; and Divis, Richard T., to Phillips Petroleum Company. Process for producing carbon black. 4,601,892, Cl. 423-456.000.

Hart, Hiram E. Deconvolution method and apparatus. 4,602,348, Cl. 364-581.000.

Harter, David W.; and van Bogaert, Joseph R., to Vulcan-Hart Corporation. Adjustable meat press for two-sided cooking. 4,601,237, Cl. 99-349.000.

Harter, Mark A.; and Schoumaker, Raoul J. P., to Westinghouse Electric Corp. Post cover for space dividing wall panel system. 4,601,146, Cl. 52-239.000.

Hartman, Adrian R.; MacRae, Alfred U.; and Shackle, Peter W., to AT&T Bell Laboratories. High voltage dielectrically isolated dual gate solid-state switch. 4,602,268, Cl. 357-38.000.

Hartmann, Rudolf-Peter: *See—*
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Hartwig, Carl S. M.; Johansson, Sven H.; and Ljung, Erik A., to Institut CERAC S.A. Electrically driven hammer machine. 4,601,351, Cl. 173-117.000.

Haruta, Masao, to Sony Corporation. Automatic reversing mechanism for cassette tape recording and reproducing apparatus. 4,602,302, Cl. 360-74.200.

Harvey Hubbell Incorporated: *See—*
Fallon, David E., 4,601,507, Cl. 294-86.420.

Harvilchuck, Joseph M.: *See—*
Adwalpalker, Avinash S.; Harvilchuck, Joseph M.; Ranalli, Joseph R.; and Rich, David W., 4,601,424, Cl. 228-124.000.

Hase, Alfred M. Auto-start and magnetic shut down battery charging and surveillance circuits. 4,602,204, Cl. 320-30.000.

Hashimoto, Kenichi: *See—*
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Hashizume, Miyakazu: *See—*
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Hashizume, Shinobu: *See—*
Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, 4,601,911, Cl. 427-34.000.

Hatsutta, Susumu; and Yasui, Takashi, to Tachikawa Spring Co., Ltd. Seat for vehicles. 4,601,515, Cl. 297-361.000.

Hattori, Toshihiro; and Ishihara, Masaki, to Isuzu Motors Limited. Vehicle electronic control method. 4,601,369, Cl. 192-3.580.

Haugen, David M., to Baker Oil Tools, Inc. Deformable metal-to-metal seal. 4,601,498, Cl. 285-332.300.

Haushofer, Bert; and Serwane, Karl. Fire proofing web with vapor barrier. 4,601,943, Cl. 428-246.000.

Havas, Janos: *See—*
Chaloux, Paul N., Jr.; and Havas, Janos, 4,601,913, Cl. 427-38.000.

Hawkins, William G.; Drake, Donald J.; and Campanelli, Michael R., to Xerox Corporation. Thermal ink jet printhead and process therefor. 4,601,777, Cl. 156-626.000.

Hayashi, Hideki: *See—*
Kikuchi, Kenichi; Iiyama, Michitomo; Ebata, Toshiki; and Hayashi, Hideki, 4,601,095, Cl. 29-571.000.
Moriyama, Yoshiaki; Gotoh, Toshio; and Hayashi, Hideki, 4,602,295, Cl. 358-343.000.

Hayashi, Mikio; and Otsuka, Fumio, to Seikosha Co., Ltd. Endless ink ribbon cassette having selective ribbon tension control. 4,601,594, Cl. 400-196.100.

Hayashi, Mikio: *See—*
Furubayashi, Toshio; Funatsu, Takenori; Inuzuka, Yoichi; Aihara, Osamu; and Hayashi, Mikio, 4,601,759, Cl. 106-308.00M.

Hayashi, Tsuneyuki; Yamauchi, Manabu; Tago, Kazuhide; Konishi, Toshio; and Hirai, Shinji, to Sony Corporation. Toroidal core winding apparatus. 4,601,433, Cl. 242-4.00R.

Hayashi, Tsutomu; and Ohzono, Kouhei, to Honda Giken Kogyo Kabushiki Kaisha. Clutch apparatus for vehicles. 4,601,375, Cl. 192-85.0AA.

Hayashi, Yoshinori: *See—*
Iijima, Kenzaburo; Hoshi, Toshiharu; Asano, Kazumoto; and Hayashi, Yoshinori, 4,601,764, Cl. 148-101.000.

HBS: *See—*
Pavie, Claude, 4,601,396, Cl. 209-569.000.
Heberlein, Joachim V. R.: *See—*
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Heeres, Jan; Backx, Leo; Vana Laerhoven, Willy; and Sturm, Elmar, to Janssen Pharmaceutica, N.V. Fungicidal 1-(-2-aryl-4,5-disubstituted-1,3-dioxolan-2-ylmethyl)-1H-imidazoles and 1H-1,2,4-triazoles. 4,602,010, Cl. 514-184.000.
Heesch, Max O., to ITT Corporation. Integral seat frame and track. 4,601,517, Cl. 297-452.000.
Hefele, Josef, to Kufner Textilwerke GmbH. Copolyamide adhesive containing behenic acid. 4,602,057, Cl. 524-300.000.
Heine, Franz; and Kowalewski, Manfred, to O&K Orenstein; and Koppel Aktiengesellschaft. Arrangement for swinging an attachment holder for the equipment of a hydraulic excavator. 4,601,626, Cl. 414-687.000.
Heinrich Buhnen KG: *See—*
Bertram, Wilhelm; Bottcher, Alfred; and Siegmann, Carl, 4,601,597, Cl. 401-1.000.
Heise, Georg: *See—*
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Heisler, Raymond A. Cover separating, feeding, placing and metering apparatus. 4,601,160, Cl. 53-485.000.
Heitmanek, William A.: *See—*
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Hejnos, Kim R.: *See—*
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Helene Holding Company: *See—*
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Hellsberg, Bert V., to Persson, Erling. Tag reader. 4,602,151, Cl. 235-383.000.
Helm, Percy R.; and Morrow, James G., Sr., to Manitowoc Company, Inc., The. Steerable concentric ring segment supported lift crane. 4,601,402, Cl. 212-189.000.
Helsley, Grover C.: *See—*
Tegeler, John J.; Diamond, Craig J.; and Helsley, Grover C., 4,602,035, Cl. 514-469.000.
Hemmah, Steven M.; and Payne, Richard S., to Analog Devices, Incorporated. Ion-implanted process for forming IC wafer with buried-reference diode and IC structure made with such process. 4,601,760, Cl. 148-1.500.
Hendricks, Wayne D., to Wehr Corporation. Alternating current clutch. 4,601,371, Cl. 192-52.000.
Henin, Jean-Pierre; and Niel, Philippe, to Fives-Cail Babcock. Process for the calcination of a pulverized mineral material. 4,601,657, Cl. 432-14.000.
Henych, Ivo: *See—*
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Herlitze, Gerhard, to Intermedicat GmbH. Injector for an infusion or transfusion system. 4,601,703, Cl. 604-86.000.
Herman, Alexander; Bolt, Murray H.; and Scavezze, Daniel C., to Codex Corporation. Local area data communication network. 4,602,364, Cl. 370-85.000.
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Zaiser, Adolf; Raichle, Dieter; Schwaiger, Helmut; Hermann, Adolf; and Bischof, Edgar, 4,601,104, Cl. 30-475.000.
Hermanson, Terry. Umbrella with lazy tong structure. 4,601,301, Cl. 135-25.00R.
Hesse, Konrad; and Diessel, Guenter, to Feinmechanische Werke Mainz GmbH. Check device for a redundant flight control apparatus. 4,601,169, Cl. 60-406.000.
Hessemann, Jurgen, to Karl Heesemann Maschinenfabrik GmbH & Co. KG. Belt grinder having pressure pads with individually variable contact pressures. 4,601,134, Cl. 51-138.000.
Hewlett-Packard Company: *See—*
Merrick, Edwin B., 4,602,322, Cl. 363-127.000.
Miller, Brian M.; and Kogler, Charles R., 4,602,225, Cl. 332-19.000.
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Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with aryl N-oxalyl-N-methylcarbamates. 4,602,033, Cl. 514-452.000.
Higashi, Hiromi: *See—*
Konotsune, Shiro; Higashi, Hiromi; Wada, Masami; Maehara, Hiroshi; and Tsuji, Kazuyuki, 4,602,065, Cl. 525-326.500.
Hill, Donna L.: *See—*
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Hill, Edward C.; Liang, George P.; and Auxier, Thomas, to United Technologies Corporation. Airfoil trailing edge cooling arrangement. 4,601,638, Cl. 416-97.00R.
Hill, Michael P.: *See—*
Fridd, Petrina F.; Taylor, Rosemary M.; and Hill, Michael P., 4,601,902, Cl. 424-70.000.
Hill, Royce W., to Ark-Plas Products Inc. Fastener head cover assembly. 4,601,624, Cl. 411-373.000.
Hillson, Murray G. Cable coupler for tree skidding cables. 4,601,506, Cl. 294-82.140.
Hilti Aktiengesellschaft: *See—*
Lang, Gusztav; Leibhard, Erich; and Froehlich, Peter, 4,601,192, Cl. 72-377.000.
Hilti, Bruno; and Mayer, Carl W., to Ciba-Geigy Corporation. (2-fluoro-5,6,11,12-tetraselenotetracene)$_2$ chloride. 4,601,853, Cl. 260-239.00R.
HIMONT Incorporated: *See—*
Cecchin, Giuliano; Guglielmi, Floriano; and Zerega, Francesco, 4,602,077, Cl. 526-339.000.
Hines, John R., to Texas Instruments Incorporated. Temperature compensated current switch. 4,602,208, Cl. 323-317.000.
Hirai, Shinji: *See—*
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Hiraishi, Masanori, to Diacel Chemical Industries, Ltd. Two-dimensional coordinate detecting apparatus. 4,602,126, Cl. 178-18.000.
Hiramatsu, Akinori: *See—*
Okonogi, Shigeo; Ono, Jyoji; Kudo, Tsutomu; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,601,985, Cl. 435-253.000.
Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cooling system for automotive engine. 4,601,264, Cl. 123-41.270.
Hirayama, Mamoru: *See—*
Tateisi, Kazuma; Nagata, Masanori; and Hirayama, Mamoru, 4,602,149, Cl. 235-379.000.
Hirohata, Michio: *See—*
Miyawaki, Makoto; Hirohata, Michio; Ogawa, Yukio; and Kodaira, Takanori, 4,601,563, Cl. 354-195.100.
Hirokami, Etsuko: *See—*
Kawakami, Katsura; Shimazaki, Shigeo; and Hirokami, Etsuko, 4,602,346, Cl. 364-518.000.
Hirose, Minoru; and Kimura, Teruaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic bank note transaction apparatus. 4,602,332, Cl. 364-408.000.
Hiroshi, Namikiri; Takeshi, Tobe; and Masahiko, Hattori, to Tokyo Tanabe Company, Limited. Method of producing solution containing D-ribose. 4,602,086, Cl. 536-125.000.
Hiroshima, Tatsuo; and Hirota, Tetsuya, to Sumitomo Metal Industries, Ltd. Method and apparatus including a flux leakage and eddy current sensor for detecting surface flaws in metal products. 4,602,212, Cl. 324-227.000.
Hirota, Tetsuya: *See—*
Hiroshima, Tatsuo; and Hirota, Tetsuya, 4,602,212, Cl. 324-227.000.
Hirsch, Kenneth S.; Jones, Charles D.; and Taylor, Harold M., to Eli Lilly and Company. Aromatase inhibitors. 4,602,025, Cl. 514-359.000.
Hiruma, Teruo: *See—*
Kurono, Takehiro; Tsuchiya, Yutaka; Inuzuka, Eiji; and Hiruma, Teruo, 4,602,282, Cl. 358-110.000.
Hitachi, Ltd.: *See—*
Ejiri, Yuuki; Ito, Tomoo; and Kamifuji, Hiroshi, 4,601,271, Cl. 123-361.000.
Kawano, Toshihiro; Ohtoshi, Tsukuru; Chinone, Naoki; Kajimura, Takashi; and Nakamura, Michiharu, 4,602,371, Cl. 372-45.000.
Kurokawa, Naohiro, 4,602,325, Cl. 364-140.000.
Nakata, Yukio; and Suda, Kaoru, 4,602,252, Cl. 340-825.500.
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,602,372, Cl. 372-58.000.
Shinkawa, Keiro, 4,602,217, Cl. 329-122.000.
Tanaka, Toshiki; Imoto, Katsuyuki; and Chinone, Naoki, 4,601,535, Cl. 350-96.200.
Tasaka, Yasuo; Masuda, Sadao; and Sasaki, Kiyoshi, 4,601,328, Cl. 165-12.000.
Yada, Yoshio; Tamai, Yasumasa; and Iwama, Tsugio, 4,601,872, Cl. 376-248.000.
Yamada, Jun, 4,602,228, Cl. 333-194.000.
Yokoyama, Shigeyoshi, 4,602,345, Cl. 364-513.000.
Hitachi Metals, Ltd.: *See—*
Umehara, Teruo; and Matsumoto, Norio, 4,602,232, Cl. 335-222.000.
Hitachi Zosen Corporation: *See—*
Fujii, Tadaomi; Kitazawa, Koji; Tomono, Yutaka; Takagi, Tomio; and Kawachi, Josuke, 4,601,877, Cl. 419-42.000.
Ho, Vu Q.: *See—*
Mercier, Jacques S.; and Ho, Vu Q., 4,601,781, Cl. 156-643.000.
Hodge, David H.: *See—*
Welch, Montgomery J.; Mitchell, Terry; and Hodge, David H., 4,601,247, Cl. 108-152.000.
Hoechst Aktiengesellschaft: *See—*
Dorn, Friedrich-Wilhelm; Wolter, Manfred; and Heymer, Gero, 4,601,887, Cl. 422-150.000.
Ebert, Hildegard; and Kreutzfeldt, Richard, 4,601,908, Cl. 426-52.000.
Obermeier, Rainer; Ludwig, Jurgen; and Seipke, Gerhard, 4,601,852, Cl. 530-303.000.
Willms, Lothar; Mildenberger, Hilmar; Baur, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,601,747, Cl. 71-92.000.
Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Effland, Richard C.; and Pierrat, Frank A., 4,602,028, Cl. 514-379.000.
Tegeler, John J.; Diamond, Craig J.; and Helsley, Grover C., 4,602,035, Cl. 514-469.000.
Hoffman, Harry W. Actuator for protective roll bar. 4,601,487, Cl. 280-756.000.

Hoffmann-La Roche Inc.: *See*—
Hanck, Alfred; and Pauling, Horst, 4,602,036, Cl. 514-494.000.
Liu, Chao-Min; Tresner, Homer D.; and Westley, John, 4,601,984, Cl. 435-119.000.
Hofmann, Wilfried; Holzmann, Andreas; Koopmann, Adolf; Meggendorfer, Ruth; and Sylla, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Autoloading microfiche reader. 4,601,558, Cl. 353-27.00R.
Hohmann, Gerhard: *See*—
Waniczek, Helmut; Hohmann, Gerhard; Bartl, Herbert; and Mott, Ludwig, 4,602,056, Cl. 524-272.000.
Hoinkis, Rainer E., to ORIGA GmbH Pneumatik. Pressure cylinder. 4,601,234, Cl. 92-88.000.
Holden, Irving H.: *See*—
Lloyd, Robert D.; Holden, Irving H.; and Brinkley, Gerald E., 4,602,311, Cl. 361-212.000.
Holzmann, Andreas: *See*—
Hofmann, Wilfried; Holzmann, Andreas; Koopmann, Adolf; Meggendorfer, Ruth; and Sylla, Jurgen, 4,601,558, Cl. 353-27.00R.
Homeyer, Bernhard: *See*—
Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,602,033, Cl. 514-452.000.
Homma, Fumiko: *See*—
Asami, Yoshiaki; Suzuki, Shintaro; Fujita, Hirotsugu; and Homma, Fumiko, 4,601,919, Cl. 427-126.300.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ando, Yoshio; Kumagai, Shuno; and Kinugasa, Toshiyuki, 4,601,652, Cl. 425-447.000.
Hayashi, Tsutomu; and Ohzono, Kouhei, 4,601,375, Cl. 192-85.0AA.
Honegger, Werner, to Ferag AG. Apparatus for winding and unwinding flexible flat products, especially printed products, arriving continuously, especially in imbricated formation. 4,601,436, Cl. 242-59.000.
Honeywell Inc.: *See*—
White, William J.; Ortolf, James M.; and Gordon, William R., 4,601,526, Cl. 339-17.0CF.
Honeywell Information Systems Inc.: *See*—
Circello, Joseph C.; Wilhite, John E.; Shelly, William A.; and Riley, Morgan S., 4,602,368, Cl. 371-21.000.
Honeywell Information Systems Italia: *See*—
Collina, Giancarlo; and Stefani, Giannico, 4,601,593, Cl. 400-121.000.
Hooven, Michael D.; and Tremulis, William S., to Cordis Corporation. Manufacture of tubing assembly for drainage catheter. 4,601,724, Cl. 623-66.000.
Hooykaas, Carel W. J., to Pelt & Hooykaas B.V. Method of processing waste materials, particularly sludge containing noxious metals. 4,601,832, Cl. 210-717.000.
Hopf, Jochen: *See*—
Lindenmeier, Heinz; Flachenecker, Gerhard; and Hopf, Jochen, 4,602,260, Cl. 343-701.000.
Horiguchi, Shinju: *See*—
Ogawa, Kaisuhiko; and Horiguchi, Shinju, 4,602,383, Cl. 382-56.000.
Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,601,647, Cl. 418-259.000.
Hornung, Klaus: *See*—
Brandenberger, Urs; Henych, Ivo; Hornung, Klaus; and Menk, Werner, 4,601,751, Cl. 75-130.00R.
Horton, James A.: *See*—
Ferretti, Michael D.; Gabel, Brian L.; and Horton, James A., 4,602,344, Cl. 364-509.000.
Hoshi, Toshiharu: *See*—
Iijima, Kenzaburo; Hoshi, Toshiharu; Asano, Kazumoto; and Hayashi, Yoshinori, 4,601,764, Cl. 148-101.000.
Hoshizaki Electric Co., Ltd.: *See*—
Suyama, Tomio, 4,601,176, Cl. 62-138.000.
Suyama, Tomio; and Sakai, Tadashi, 4,601,178, Cl. 62-347.000.
House, Leona: *See*—
Bjorklund, John G., 4,601,789, Cl. 202-167.000.
House, Leonard J.: *See*—
Bjorklund, John G., 4,601,789, Cl. 202-167.000.
Howard, Victor A. D.; and Heitmanek, William A., to Micron Industries Corp. Transformer assembly with terminal plates in support. 4,602,235, Cl. 336-192.000.
Howie, Blake J.: *See*—
Tiwari, Basant L.; and Howie, Blake J., 4,601,810, Cl. 204-413.000.
Hsieh, Chyi-Hun. Sounding device for dolls. 4,601,669, Cl. 446-303.000.
Hsu, Samuel K. Race track cushioning surface. 4,601,925, Cl. 428-17.000.
Hsu, Yen-hwa: *See*—
Purcell, John R.; and Hsu, Yen-hwa, 4,602,231, Cl. 335-216.000.
Huang, Chung-Siung; and Kuo, Hsien-Ching. Tire pressure warning device. 4,601,254, Cl. 116-34.00R.
Huang, Suchin: *See*—
Kiely, John S.; and Huang, Suchin, 4,602,023, Cl. 514-346.000.
Hudgins, Richard G. Air treatment apparatus. 4,601,886, Cl. 422-116.000.
Hudson, James E., to Quest Medical, Inc. Volumetric infusion actuator. 4,601,702, Cl. 604-246.000.
Huels Aktiengesellschaft: *See*—
Bartmann, Martin; and Burzin, Klaus, 4,601,851, Cl. 252-522.00R.
Hughes Tool Company: *See*—
Evans, Robert W., 4,601,333, Cl. 166-115.000.
Hull, Diane H. Gas-inflatable, floatable portable seat. 4,601,667, Cl. 441-131.000.
Hummel, Klaus: *See*—
Scherm, Arthur; and Hummel, Klaus, 4,602,037, Cl. 514-512.000.
Humphrey, Dallas R: *See*—
West, Roger A.; Humphrey, Dallas R; Bergquist, Carl R.; and DeGree, David C., 4,602,125, Cl. 174-138.00G.
Hung, Ju-Ming, to Rohm and Haas Company. Coagulation process. 4,602,083, Cl. 528-488.000.
Hunt, Mack W.: *See*—
Valcho, Joseph J.; Lindberg, Steven E.; Hunt, Mack W.; and Sabol, Albert R., 4,601,837, Cl. 252-40.700.
Hurter, Rudolf, to Ciba-Geigy Corporation. Monoazo dyes containing a 4-substituted-2-azo-1,1'-diphenylsulfone component. 4,602,084, Cl. 534-641.000.
Hust, Gary A.: *See*—
Kush, Donald C.; and Hust, Gary A., 4,601,112, Cl. 34-9.000.
Hutchinson, Derek: *See*—
Dean, Robert; Reyner, Peter J.; and Hutchinson, Derek, 4,601,380, Cl. 194-318.000.
Hutchinson, Francis G.: *See*—
Chantler, Eric N.; Hutchinson, Francis G.; and Sharman, Deborah A., 4,602,042, Cl. 514-635.000.
Hutchison, James M. S.: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,602,214, Cl. 324-309.000.
Hutner, Mark A., to Xerox Corporation. Zip code sorter for article labeling system. 4,601,394, Cl. 209-3.300.
Hutton, Roger L.; and Williams, John P., Jr. Induction bonding method and apparatus. 4,602,139, Cl. 219-10.430.
Huybrechts, Jozef T.; Meeus, Ferdinand F.; and Timmerman, August T., to Du Pont de Nemours, E. I., and Company. Chip-resistant paint containing epoxyester linear block oligomer. 4,602,053, Cl. 523-436.000.
Hyde, Robert W. Buoyancy device. 4,601,609, Cl. 405-186.000.
Hydroacoustics, Inc.: *See*—
Bouyoucos, John V.; and Durfee, David W., 4,601,768, Cl. 156-73.500.
Durfee, David W., 4,601,927, Cl. 428-35.000.
Hyosu, Yoshihiko, to Canon Kabushiki Kaisha. Process for producing toner for development of electrostatic images by stepwise suspension polymerizations. 4,601,968, Cl. 430-137.000.
Iatron Laboratories, Inc.: *See*—
Ogawa, Kazuo; Baba, Setsuko; and Nakanishi, Kazuo, 4,601,977, Cl. 435-13.000.
Ichiba, Yoshiyuki: *See*—
Mori, Shigeki; Itoi, Akihiro; and Ichiba, Yoshiyuki, 4,601,434, Cl. 242-35.50A.
Ichitani, Tetsuro: *See*—
Saito, Shunji; and Ichitani, Tetsuro, 4,602,301, Cl. 360-69.000.
ICI Australia Limited: *See*—
Markus, Michael V.; and Barnett, George H., 4,602,045, Cl. 521-27.000.
Ide, Fumito: *See*—
Takano, Shoji; and Ide, Fumito, 4,601,568, Cl. 355-8.000.
Ide, Yukio; and Ohseto, Seiichi, to Ricoh Co., Ltd. Photosensitive material for use in electrophotography. 4,601,965, Cl. 430-85.000.
Idux Industriell Exploatering AB: *See*—
Arwidsson, Lars I.; and Dahlander, Lennart E. R., 4,601,480, Cl. 280-43.120.
IHC Holland NV: *See*—
Arentsen, Dik, 4,601,349, Cl. 173-116.000.
Iida, Shinobu; Yamaguchi, Nobutaka; Tsukuda, Fumiaki; Fujiyama, Masaaki; and Tadokoro, Eiichi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,601,946, Cl. 428-323.000.
Iida, Tamaki; and Inoue, Kaname, to Shin-Etsu Chemical Co., Ltd. Magnetic recording medium and manufacturing method thereof. 4,601,950, Cl. 428-421.000.
Iijima, Kenzaburo; Hoshi, Toshiharu; Asano, Kazumoto; and Hayashi, Yoshinori, to Nippon Gakki Seizo Kabushiki Kaisha. Method for producing anistropic configuration magnet. 4,601,764, Cl. 148-101.000.
Iiyama, Michitomo: *See*—
Kikuchi, Kenichi; Iiyama, Michitomo; Ebata, Toshiki; and Hayashi, Hideki, 4,601,095, Cl. 29-571.000.
Iizuka, Haruhiko: *See*—
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,602,247, Cl. 340-575.000.
Ikeda, Masami: *See*—
Matsuda, Hiroto; Shibata, Makoto; Ikeda, Masami; and Takahashi, Hiroto, 4,602,261, Cl. 346-140.00R.
Ikeda, Sadao; Imahashi, Kunihiko; and Iwata, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Outerrace of universal joint with cross grooves. 4,601,191, Cl. 72-354.000.
Ikeya, Fumihiro, to Panafacom Limited. Data processor. 4,602,330, Cl. 364-200.000.
Illinois Tool Works Inc.: *See*—
Ernst, Richard J.; Peterson, Francis C.; and Sledz, Melissa L., 4,601,625, Cl. 411-387.000.
Imahashi, Kunihiko: *See*—
Ikeda, Sadao; Imahashi, Kunihiko; and Iwata, Yasuo, 4,601,191, Cl. 72-354.000.
Imai, Masanori: *See*—
Kita, Nobuyuki; Matsumoto, Hiroshi; and Imai, Masanori, 4,601,974, Cl. 430-309.000.

Imanari, Junichi: *See*—
Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, 4,601,988, Cl. 501-134.000.
Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, 4,601,989, Cl. 501-136.000.
Imoto, Katsuyuki: *See*—
Tanaka, Toshiki; Imoto, Katsuyuki; and Chinone, Naoki, 4,601,535, Cl. 350-96.200.
Imperial Chemical Industries PLC: *See*—
Chantler, Eric N.; Hutchinson, Francis G.; and Sharman, Deborah A., 4,602,042, Cl. 514-635.000.
Ratcliffe, Maurice J.; Shaw, Derek J.; and Robinson, Peter A., 4,602,076, Cl. 522-7.000.
Shindler, Brian D., 4,601,906, Cl. 424-195.100.
Inaba, Ritsuo: *See*—
Kasahara, Yukio; and Inaba, Ritsuo, 4,602,159, Cl. 250-338.000.
Inaba, Yoshiharu, to Fanuc Ltd. Injection mechanism in injection molding apparatus. 4,601,653, Cl. 425-587.000.
Inamoto, Yoshiaki: *See*—
Fujikura, Yoshiaki; Takaishi, Naotake; and Inamoto, Yoshiaki, 4,602,107, Cl. 562-499.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Berutto, Eugenio; Franchino, Giovanni; and Sella, Lino, 4,602,138, Cl. 200-340.000.
Musso, Pietro, 4,601,596, Cl. 400-697.100.
Inland Steel Company: *See*—
Rastogi, Prabhat K.; and Lyudkovsky, Grigory, 4,601,766, Cl. 148-111.000.
Inoue, Kaname: *See*—
Iida, Tamaki; and Inoue, Kaname, 4,601,950, Cl. 428-421.000.
Inoue, Toshitsugu; Ishihara, Hiromasa; and Morimoto, Masato, to Matsushita Electric Industrial Co., Ltd. Reduction gear. 4,601,216, Cl. 74-640.000.
Institut CERAC S.A.: *See*—
Hartwig, Carl S. M.; Johansson, Sven H.; and Ljung, Erik A., 4,601,351, Cl. 173-117.000.
Institut National de Recherche en Informatique et en Automatique: *See*—
Finger, Ulrich; Ligneres, Pierre; and O'Donnell, Ciaran, 4,602,328, Cl. 364-200.000.
Intel Corporation: *See*—
Broadbent, Neal E., 4,602,314, Cl. 361-386.000.
Interag RT: *See*—
Szeles, Lajos, 4,601,905, Cl. 424-195.100.
Interatom GmbH: *See*—
Cyron, Theodor, 4,602,001, Cl. 502-439.000.
Intermedicat GmbH: *See*—
Herlitze, Gerhard, 4,601,703, Cl. 604-86.000.
International Business Machines Corporation: *See*—
Abernathey, John R.; Lasky, Jerome B.; Nesbit, Larry A.; Sedgwick, Thomas O.; and Stiffler, Scott; R., 4,601,779, Cl. 156-628.000.
Adwalpalker, Avinash S.; Harvilchuck, Joseph M.; Ranalli, Joseph R.; and Rich, David W., 4,601,424, Cl. 228-124.000.
Aviles, Henry E.; and Gregory, Jane A., 4,601,637, Cl. 414-739.000.
Bertin, Claude L., 4,602,170, Cl. 307-450.000.
Bianchi, Jacqueline K.; Gdula, Robert A.; and Lange, Dennis J., 4,601,782, Cl. 156-643.000.
Castagna, Joseph T., 4,602,175, Cl. 310-13.000.
Chaloux, Paul N., Jr.; and Havas, Janos, 4,601,913, Cl. 427-38.000.
Clecak, Nicholas J.; Grant, Barbara D.; Miller, Robert D.; Tompkins, Terry C.; and Willson, Carlton G., 4,601,969, Cl. 430-192.000.
Dougherty, William E., Jr.; Greer, Stuart E.; Nestork, William J.; and Norris, William T., 4,602,271, Cl. 357-80.000.
Gati, George S.; Lee, Albert P.; Schwartz, Geraldine C.; and Standley, Charles L., 4,601,939, Cl. 428-161.000.
Gore, Albert N., III; Lynch, Robert C.; McAdams, Ronald P.; and Shekita, Gregory A., 4,602,164, Cl. 307-91.000.
Lo, John C.; and Lu, Neng-hsing, 4,601,807, Cl. 204-298.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,601,850, Cl. 252-522.00R.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,601,835, Cl. 252-8.900.
International Minerals & Chemical Corp.: *See*—
Crain, Kenny K., 4,601,699, Cl. 604-64.000.
Interox (Societe Anonyme): *See*—
Coeckelberghs, Paul; and Depoorter, Willy, 4,601,884, Cl. 422-113.000.
Inui, Tsuneo: *See*—
Fujimoto, Terunori; Nakagawa, Yasuhiko; Baba, Toshio; Moriyama, Hirokazu; Miyachi, Akio; and Inui, Tsuneo, 4,601,957, Cl. 428-622.000.
Inukai, Thomas, to Communications Satellite Corporation. Onboard clock correction by means of drift prediction. 4,602,375, Cl. 375-109.000.
Inuzuka, Eiji: *See*—
Kurono, Takehiro; Tsuchiya, Yutaka; Inuzuka, Eiji; and Hiruma, Teruo, 4,602,282, Cl. 358-110.000.
Inuzuka, Yoichi: *See*—
Furubayashi, Toshio; Funatsu, Takenori; Inuzuka, Yoichi; Aihara, Osamu; and Hayashi, Mikio, 4,601,759, Cl. 106-308.00M.
Isenberg, Andreas: *See*—
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; Enzenberg, Hartmut; and Isenberg, Andreas, 4,601,846, Cl. 252-299.100.
Ishida, Masaaki: *See*—
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Ishihara, Hiromasa: *See*—
Inoue, Toshitsugu; Ishihara, Hiromasa; and Morimoto, Masato, 4,601,216, Cl. 74-640.000.
Ishihara, Masaki: *See*—
Hattori, Toshihiro; and Ishihara, Masaki, 4,601,369, Cl. 192-3.580.
Ishii, Shizuo: *See*—
Yoneyama, Saburo; Fujita, Masami; Ishii, Shizuo; Kichima, Mutsuhito; Takahashi, Yoshiharu; and Sameshima, Yoshinobu, 4,601,562, Cl. 354-170.000.
Ishii, Toshio: *See*—
Fukuda, Shuzo; Ohkubo, Yutaka; Ishii, Toshio; Sagiyama, Masaru; and Tonouchi, Akira, 4,601,801, Cl. 204-206.000.
Ishikawa, Masao: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Ishikawa, Masao; Kon, Masahiko; and Kuse, Satoru, 4,601,975, Cl. 430-393.000.
Isohata, Junji; and Karasawa, Tamotsu, to Canon Kabushiki Kaisha. Focus adjustment in an alignment and exposure apparatus. 4,601,560, Cl. 353-122.000.
Isuzu Motors Limited: *See*—
Hattori, Toshihiro; and Ishihara, Masaki, 4,601,369, Cl. 192-3.580.
Itek Corporation: *See*—
Barrett, John R., 4,602,158, Cl. 250-338.000.
Ito, Haruo: *See*—
Yamada, Kenzo; Iwasaki, Katsuhiro; Ohtsuki, Mitsuru; and Ito, Haruo, 4,601,749, Cl. 75-53.000.
Ito, Koichi: *See*—
Nakamori, Shigeru; Ishida, Masaaki; Takagi, Hiroshi; Miwa, Kiyoshi; Ito, Koichi; and Sano, Konosuke, 4,601,983, Cl. 435-115.000.
Ito, Masaaki: *See*—
Ando, Minato; Ito, Masaaki; and Kato, Takashi, 4,601,990, Cl. 501-153.000.
Ando, Minato; and Ito, Masaaki, 4,601,991, Cl. 501-153.000.
Ito, Teruyuki; and Toyama, Osamu, to Toyoda Koki Kabushiki Kaisha. Multilink-type robot. 4,601,635, Cl. 414-730.000.
Ito, Tomoo: *See*—
Ejiri, Yuuki; Ito, Tomoo; and Kamifuji, Hiroshi, 4,601,271, Cl. 123-361.000.
Ito, Yukihiko: *See*—
Sakai, Masao; Sugimoto, Makoto; Hashizume, Miyakazu; Tanaka, Yutaka; and Ito, Yukihiko, 4,601,848, Cl. 252-503.000.
Itoh, Tetsuroh, to Mitsubishi Denki Kabushiki Kaisha. Electric discharge system including means to normalize the interpole gap to minimize abnormal discharge conditions. 4,602,142, Cl. 219-69.00C.
Itoi, Akihiro: *See*—
Mori, Shigeki; Itoi, Akihiro; and Ichiba, Yoshiyuki, 4,601,434, Cl. 242-35.50A.
ITT Corporation: *See*—
Chea, Ramon C. W., Jr., 4,602,130, Cl. 179-18.0FA.
Das, Santanu; Middleton, Francisco A.; and Carter, Nicholas J. R., 4,602,363, Cl. 370-58.000.
Goeb, Robert; and Gaspar, Luis M., 4,602,223, Cl. 332-9.00R.
Hargrave, Franklin; Middleton, Francisco A.; and Das, Santanu, 4,602,362, Cl. 370-54.000.
Heesch, Max O., 4,601,517, Cl. 297-452.000.
Iwama, Tsugio: *See*—
Yada, Yoshio; Tamai, Yasumasa; and Iwama, Tsugio, 4,601,872, Cl. 376-248.000.
Iwanaga, Kazuyoshi, to Nissan Motor Co., Ltd. Lubrication arrangement for final gear unit of automotive transaxle. 4,601,219, Cl. 74-867.000.
Iwasaki, Katsuhiro: *See*—
Yamada, Kenzo; Iwasaki, Katsuhiro; Ohtsuki, Mitsuru; and Ito, Haruo, 4,601,749, Cl. 75-53.000.
Iwata, Akira: *See*—
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Kuroyanagi, Masatoshi; Suzuki, Masahiko; and Iwata, Hiroshi, 4,601,641, Cl. 417-220.000.
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J. T. Slocomb Co.: *See*—
Gregory, Barry W., 4,601,803, Cl. 204-224.00M.
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Oinonen, Hannu; and Jaaskelainen, Jyrki, 4,601,441, Cl. 242-56.00R.
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Jan, Shaw G. Apparatus for forming a concrete structure. 4,601,456, Cl. 249-91.000.

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Laneus, Per, 4,601,518, Cl. 299-13.000.

Jennings, Alfred R., Jr., to Mobil Oil Corporation. Method for plugging a wellbore in high impulse fracturing. 4,601,339, Cl. 166-281.000.

Jennmar Corporation: *See*—
Barish, Ken; and Yacisin, Paul, 4,601,616, Cl. 405-288.000.

Jensen, Garold K. Intruder detector apparatus. 4,602,246, Cl. 340-521.000.

Jensen, Jay E., to Mobil Oil Corporation. Electro-optical fuel blending process. 4,601,303, Cl. 137-3.000.

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Hartwig, Carl S. M.; Johansson, Sven H.; and Ljung, Erik A., 4,601,351, Cl. 173-117.000.

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Barrett, Michael E.; and Johnson, Chris, 4,601,477, Cl. 279-30.000.

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Damp, Stephen P.; Johnson, Harvey G.; and Neufeldt, Allen A., 4,601,605, Cl. 404-95.000.

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Fidel, Howard F.; and Greenwood, David L., 4,601,292, Cl. 128-660.000.

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Jolly, Thomas A. Triangular gun sight. 4,601,121, Cl. 42-100.000.

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Harry, Ieuan L.; Krihsnakumar, Suppayan M.; Jolly, Walter R.; and Beck, Martin H., 4,601,869, Cl. 264-523.000.

Jones, Andrew W.; and Merry, Raymond. Free flyable structure. 4,601,443, Cl. 244-13.000.

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Hirsch, Kenneth S.; Jones, Charles D.; and Taylor, Harold M., 4,602,025, Cl. 514-359.000.

Jones, Dallas W. Energy balance process for the pulp and paper industry. 4,601,262, Cl. 122-7.00R.

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Jordan, James R.: *See*—
Blackley, William S.; Jack, Mervyn A.; and Jordan, James R., 4,602,349, Cl. 364-728.000.

Jordan, Pavel. Automatic injection for syringe needle, and assembly. 4,601,708, Cl. 604-136.000.

Joseph, Edward A.; and Trego, Brian R., to Dow Corning, Ltd.; and Dow Corning, S.A. Silicone elastomers and adhesion promoter therefor. 4,602,078, Cl. 528-34.000.

Joy Manufacturing Company: *See*—
Stone, Ralph S.; and Shelton, William S., 4,601,308, Cl. 137-315.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich, 4,601,522, Cl. 384-19.000.

Juvinall, John W.; Lovalenti, Sam; and Rogge, William H., to Owens-Illinois, Inc. Inspecting and sorting of glass containers. 4,601,395, Cl. 209-526.000.

K.C. Southern Railway Company: *See*—
Perlmutter, Leonard, 4,602,335, Cl. 364-426.000.

K.M.P. Manufacturing Co., Inc.: *See*—
Parish, Carl D., 4,601,347, Cl. 172-134.000.

Kabbaby, Charles. Shower-mounted douche apparatus. 4,601,709, Cl. 604-150.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Takeuchi, Hiroshi, 4,601,677, Cl. 464-68.000.
Tojima, Hiromi; and Kajitani, Kouji, 4,601,676, Cl. 464-24.000.

Kabushiki Kaisha Hanzawa Corporation: *See*—
Koizumi, Rikihachiro, 4,601,674, Cl. 446-440.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Takahashi, Naoki, 4,601,355, Cl. 177-2.000.

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Amano, Itaru; Kurumaji, Masanobu; Misumi, Shikao; Fujieda, Yasuhiko; and Kanzawa, Masahide, 4,601,648, Cl. 425-47.000.
Kawai, Nobuyasu; Tsuji, Kunihiko; and Beppu, Kohichi, 4,601,087, Cl. 29-157.10R.

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Komori, Tomoyasu, 4,602,333, Cl. 364-414.000.
Nakamura, Yoshiro; Mori, Kunio; Okumura, Minoru; Mochida, Yoshio; and Miyazaki, Matsuo, 4,601,933, Cl. 428-36.000.
Sekine, Akio, 4,602,293, Cl. 358-280.000.
Takano, Shoji; and Ide, Fumito, 4,601,568, Cl. 355-8.000.

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Fijiwara, Keiji; Shinoda, Takaaki; Kitou, Shigehiro; and Kawabe, Suenobu, 4,601,736, Cl. 55-479.000.

Kadota, Otomatsu; and Kobayashi, Masao. Roulette gaming apparatus having electro-magnetic apparatus for driving a ball. 4,601,470, Cl. 273-142.00E.

Kagan, Michael. Open reel adjustable hanger. 4,601,453, Cl. 248-329.000.

Kagansky, Arkady I.: *See*—
Roiz, Lev M.; Petukhov, Mikhail M.; and Kagansky, Arkady I., 4,602,185, Cl. 313-25.000.

Kagi, Otto: *See*—
Schiltknecht, Bruno; Arnold, Gebhard; Kagi, Otto; Fricker, Robert; and Troxler, Beat, 4,601,416, Cl. 222-600.000.

Kago, Yoshiyuki; and Akita, Shigeyuki, to Nippon Soken, Inc. Luggage door unlocking device for a vehicle. 4,602,256, Cl. 340-825.720.

Kahle, Gerald R.: *See*—
Matson, Michael S.; and Kahle, Gerald R., 4,602,114, Cl. 549-266.000.

Kai Cutlery Center Co., Ltd.: *See*—
Sugiyama, Makoto, 4,601,103, Cl. 30-162.000.

Kaijiri, Kohei: *See*—
Yamamoto, Shinji; Kaijiri, Kohei; and Nagakura, Koichi, 4,602,063, Cl. 525-127.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Kush, Donald C.; and Hust, Gary A., 4,601,112, Cl. 34-9.000.

Kajimura, Takashi: *See*—
Kawano, Toshihiro; Ohtoshi, Tsukuru; Chinone, Naoki; Kajimura, Takashi; and Nakamura, Michiharu, 4,602,371, Cl. 372-45.000.

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Tojima, Hiromi; and Kajitani, Kouji, 4,601,676, Cl. 464-24.000.

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Derleth, Helmut; Sauer, Guenther; and Bretz, Karl-Heinz, 4,601,992, Cl. 502-64.000.

Kalkbrenner, Ralph W.; and Leumann, Hans E., to Westinghouse Electric Corp. Clamping device for rectangular workpiece. 4,601,221, Cl. 81-418.000.

Kamerling, William. Posterior chamber intra-ocular device. 4,601,721, Cl. 623-6.000.

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Ejiri, Yuuki; Ito, Tomoo; and Kamifuji, Hiroshi, 4,601,271, Cl. 123-361.000.

Kamm, Kevin L., to Fisons plc. Centrifuge provided with a rotor identification. 4,601,696, Cl. 494-10.000.

Kammann, Karl P., Jr.; and Wagner, Terrence L., to Ferro Corporation. Water-soluble chlorinated fatty ester additives. 4,601,838, Cl. 252-49.300.

Kan, Hsin-Chia: *See*—
Grashof, Hans R.; Kan, Hsin-Chia; Sandhu, M. Akram; Wright, John F.; and Yacobucci, Paul D., 4,601,966, Cl. 430-109.000.

Kan, Jean-Paul: *See*—
Crisafulli, Emilio; Frigerio, Marco; and Kan, Jean-Paul, 4,602,015, Cl. 514-252.000.

Kandybowski, Steven J., to AMP Incorporated. Cover for chip carrier sockets. 4,601,525, Cl. 339-75.0MP.

Kanebo, Ltd.: *See*—
Yata, Shizukuni, 4,601,849, Cl. 252-500.000.

Kaneko, Hideo; Kumashiro, Hatuyoshi; and Iwata, Akira, to Kawasaki Jukogyo Kabushiki Kaisha. Horizontal continuous casting installation. 4,601,327, Cl. 164-502.000.

Kaneko, Tetsuya; Saeki, Masaru; Tanaka, Kiyoshi; and Kawakita, Tetsuya, to Ajinomoto Co., Inc. Purification of lysine by reverse-phase osmosis. 4,601,829, Cl. 210-638.000.

Kang, Jung W.; and Davis, James A., to Firestone Tire & Rubber Company, The. Rubber compositions and related articles having improved metal adhesion and metal adhesion retention. 4,602,054, Cl. 524-83.000.

Kanno, Fuchio: *See*—
Takahashi, Michio; Tanaka, Mitsuo; Kanno, Fuchio; and Kobayashi, Kazuo, 4,601,963, Cl. 430-69.000.

Kantz, Dieter: *See*—
Wawersig, Jurgen; and Kantz, Dieter, 4,602,353, Cl. 365-189.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Shioi, Shunshuke; Matoba, Gensuke; and Miyake, Makoto, 4,602,264, Cl. 346-205.000.
Shioi, Shunsuke; Matoba, Gensuke; and Miyake, Makoto, 4,601,863, Cl. 264-4.300.

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Amano, Itaru; Kurumaji, Masanobu; Misumi, Shikao; Fujieda, Yasuhiko; and Kanzawa, Masahide, 4,601,648, Cl. 425-47.000.

Kao Corporation: *See*—
Fujikura, Yoshiaki; Takaishi, Naotake; and Inamoto, Yoshiaki, 4,602,107, Cl. 562-499.000.

Karasawa, Tamotsu: *See*—
Isohata, Junji; and Karasawa, Tamotsu, 4,601,560, Cl. 353-122.000.

Karin, Michael, to University of California, The Regents of the. Mammalian metallothionein promoter system. 4,601,978, Cl. 435-68.000.

Karino, Yukio, to Fuji Photo Film Co., Ltd. Multilayer color photographic light-sensitive material. 4,601,976, Cl. 430-496.000.

Karl Heesemann Maschinenfabrik GmbH & Co. KG: *See*—
Hessemann, Jurgen, 4,601,134, Cl. 51-138.000.

Karl M. Reich Maschinenfabrik Gesellschaft mit beschraenkter Haftung: *See*—
Zaiser, Adolf; Raichle, Dieter; Schwaiger, Helmut; Hermann, Adolf; and Bischof, Edgar, 4,601,104, Cl. 30-475.000.

Karlsson, Bo A. E., to Telefonaktiebolaget LM Ericsson. Clamp fastener. 4,601,600, Cl. 403-338.000.

Karning, Heinrich; Raubinger, Gerhard; and Weigel, Wolfgang, to Eltro GmbH. Method and apparatus for the turning on and off of a signal in optical or optronic devices. 4,601,540, Cl. 350-266.000.

Karrenbauer, Michael; and Kleemann, Axel, to Degussa Aktiengesellschaft. Process for the racemization of N-acetyl-D,L-α-aminocarboxylic acids. 4,602,096, Cl. 548-498.000.

Kasahara, Yukio; and Inaba, Ritsuo, to Matsushita Electric Industrial Co., Ltd. Infrared detector. 4,602,159, Cl. 250-338.000.

Kato, Heizaburo, to Sankyo Manufacturing Company, Ltd. Roll feed apparatus. 4,601,420, Cl. 226-154.000.

Kato, Masaaki; Tojo, Shigeki; and Arai, Kazuyoshi, to Nippondenso Co., Ltd. Fuel injection nozzle. 4,601,269, Cl. 123-300.000.

Kato, Mitsuo: *See*—
Tsuda, Tetsuaki; Asano, Kazuo; Shibuya, Atsuyoshi; Nishihara, Minoru; Yanagi, Kenichi; Kato, Mitsuo; Yamada, Katsuhiko; and Fujisaka, Teijiro, 4,601,794, Cl. 204-15.000.

Kato, Takashi: *See*—
Ando, Minato; Ito, Masaaki; and Kato, Takashi, 4,601,990, Cl. 501-153.000.

Katoh, Hiroyasu, to Katoh Kinzoku Kogyo Kabushiki Kaisha. Ballpoint pen. 4,601,599, Cl. 401-99.000.

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Katoh, Hiroyasu, 4,601,599, Cl. 401-99.000.

Kaufman, Jack W. Article for the protection of living tissues. 4,601,286, Cl. 128-132.00D.

Kaveh, Farrokh, to Owens-Corning Fiberglas Corporation. Blower for mineral fiberizer. 4,601,742, Cl. 65-14.000.

Kawabe, Suenobu: *See*—
Fijiwara, Keiji; Shinoda, Takaaki; Kitou, Shigehiro; and Kawabe, Suenobu, 4,601,736, Cl. 55-479.000.

Kawachi, Josuke: *See*—
Fujii, Tadaomi; Kitazawa, Koji; Tomono, Yutaka; Takagi, Tomio; and Kawachi, Josuke, 4,601,877, Cl. 419-42.000.

Kawagoe, Nobukazu: *See*—
Yuasa, Yoshio; and Kawagoe, Nobukazu, 4,601,571, Cl. 355-38.000.

Kawaguchi, Ikumi: *See*—
Kida, Yasuji; Miura, Kaoru; and Kawaguchi, Ikumi, 4,602,075, Cl. 526-293.000.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,601,229, Cl. 84-1.010.

Kawai, Nobuyasu; Tsuji, Kunihiko; and Beppu, Kohichi, to Kabushiki Kaisha Kobe Seiko Sho. Method for cladding interior surfaces with externally prefabricated cladding material. 4,601,087, Cl. 29-157.10R.

Kawakami, Katsura; Shimazaki, Shigeo; and Hirokami, Etsuko, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for processing image data using sum and subtract operations. 4,602,346, Cl. 364-518.000.

Kawakita, Tetsuya: *See*—
Kaneko, Tetsuya; Saeki, Masaru; Tanaka, Kiyoshi; and Kawakita, Tetsuya, 4,601,829, Cl. 210-638.000.

Kawakubo, Yukio: *See*—
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,602,372, Cl. 372-58.000.

Kawamatsu, Yutaka: *See*—
Awata, Takashi; Maenaka, Tomio; and Kawamatsu, Yutaka, 4,602,026, Cl. 514-369.000.

Kawamura, Kazue: *See*—
Shiio, Isamu; Sugimoto, Shinichi; and Kawamura, Kazue, 4,601,982, Cl. 435-108.000.

Kawano, Toshihiro; Ohtoshi, Tsukuru; Chinone, Naoki; Kajimura, Takashi; and Nakamura, Michiharu, to Hitachi, Ltd. High output semiconductor laser device utilizing a mesa-stripe optical confinement region. 4,602,371, Cl. 372-45.000.

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Kaneko, Hideo; Kumashiro, Hatuyoshi; and Iwata, Akira, 4,601,327, Cl. 164-502.000.

Kawasaki, Kenzo, to Alps Electric Co., Ltd. Pull-push switch. 4,602,137, Cl. 200-76.000.

Kayser, Harald, to U.S. Philips Corporation. X-ray image recording device. 4,602,157, Cl. 250-327.200.

Kazutoshi, Takagi: *See*—
Yoshino, Hisakazu; Nishimura, Shinichi; and Kazutoshi, Takagi, 4,601,550, Cl. 350-516.000.

Keel, Jerry L., to Lvco Corporation. Current monitoring apparatus. 4,602,216, Cl. 324-126.000.

Kellar, Paul R. N.; and Searby, Anthony D., to Quantel Limited. Video processing for composite images. 4,602,286, Cl. 358-183.000.

Keller, Lewis C.: *See*—
Fitzwater, Margaret; and Keller, Lewis C., 4,601,227, Cl. 83-403.000.

Keller, Margaret S.; and Kluger, Edward W., to Milliken Research Corporation. Thiophene based fugitive colorants. 4,601,725, Cl. 8-403.000.

Kelly, Gordon E.; and Nakanishi, Mutsuo, to Zenith Electronics Corporation. Adapter for rendering a non-addressable CATV converter addressable. 4,602,284, Cl. 358-122.000.

Kelly, Kevin: *See*—
Soulliard, Charles; Kelly, Kevin; and Lehman, Philip, 4,602,131, Cl. 179-84.0VF.

Kelly, Laura A.: *See*—
Graham, Stephen L.; and Kelly, Laura A., 4,602,058, Cl. 524-320.000.

Kelly, Raymond L., to BP Chemicals Limited. Organo metallic complexes and the use thereof in epoxidation of olefins. 4,602,100, Cl. 549-529.000.

Kelly, Reba A.: *See*—
Sutton, Raymond K.; and Kelly, Reba A., 4,601,081, Cl. 15-104.940.

Kelman, Arnold L.; Prendergast, John F.; Stevens, Edward P.; and Lang, George R., to General Electric Company. X-ray table. 4,602,378, Cl. 378-26.000.

Kelman, Charles D. Intraocular lens. 4,601,722, Cl. 623-6.000.

Kennecott Corporation: *See*—
Amorese, Franklyn J., 4,601,583. Cl. 366-343.000.

Kentek Information Systems, Inc.: *See*—
Yamashita, Keitaro, 4,601,259, Cl. 118-658.000.

Kerian, Paul D. Streamlining appendage for vehicles. 4,601,508, Cl. 296-1.00S.

Kern, Seymour P. Variable power lens system. 4,601,545, Cl. 350-347.00V.

Keshavjee, Firoz A.: *See*—
McKay, Glen; Smith, Henry F.; Price, Ronald W.; and Keshavjee, Firoz A., 4,601,208, Cl. 73-829.000.

Kessler, Sebastian W., Jr.; and Lavering, Gordon R., to Varian Associates, Inc. Multiple heat pipes for linear beam tubes having common coolant and vaporizing surface area enhancement. 4,601,331, Cl. 165-104.330.

Ketcham & McDougall, Inc.: *See*—
Verdi, Anthony J., 4,601,316, Cl. 144-28.720.

Keystone Industries Inc.: *See*—
Brough, Steve A.; and Scott, Mark P., 4,601,461, Cl. 267-64.150.

Khare, Ashok K., to National Forge Company. Weld forming of pipe molds. 4,601,322, Cl. 164-286.000.

Kichima, Mutsuhito: *See*—
Yoneyama, Saburo; Fujita, Masami; Ishii, Shizuo; Kichima, Mutsuhito; Takahashi, Yoshiharu; and Sameshima, Yoshinobu, 4,601,562, Cl. 354-170.000.

Kida, Yasuji; Miura, Kaoru; and Kawaguchi, Ikumi, to Tokuyama Soda Kabushiki Kaisha. Monomeric mixture for cured polymeric material used in organic glass. 4,602,075, Cl. 526-293.000.

Kidode, Masatsugu: *See*—
Sawada, Nobuo; Kidode, Masatsugu; and Shinoda, Hidenori, 4,602,251, Cl. 340-724.000.

Kiely, John S.; and Huang, Suchin, to Warner-Lambert Company. Diphenic acid monoamides. 4,602,023, Cl. 514-346.000.

Kikuchi, Kenichi; Iiyama, Michitomo; Ebata, Toshiki; and Hayashi, Hideki, to Sumitomo Electric Industries, Ltd. Process for fabricating a Schottky-barrier gate field effect transistor. 4,601,095, Cl. 29-571.000.

Kikuchi, Masafumi, to Sony Corporation. High input impedance circuit. 4,602,172, Cl. 307-494.000.

Kilgore, Lee A.: *See*—
Kuznetsov, Stephen B.; and Kilgore, Lee A., 4,602,179, Cl. 310-178.000.

Kim, Hyung S. Ammunition cartridge. 4,601,278, Cl. 124-57.000.

Kim, Kun H., to Von Duprin, Inc. Operating mechanism for a closure latching assembly. 4,601,499, Cl. 292-36.000.

Kim, Suk K.; and Zimany, Edward J., Jr., to AT&T Bell Laboratories. Temperature and power supply stable current source. 4,602,207, Cl. 323-313.000.

Kimball, Charles R. Mechanism to reciprocate and rotate a ram. 4,601,213, Cl. 74-23.000.

Kimball, William G.: *See*—
Starnes, Dennis L.; Kimball, William G.; and Watson, Robert E., 4,601,225, Cl. 83-175.000.

Kimberley, John A.; and Bullis, Robert H., to United Technologies Diesel Systems, Inc. Method and apparatus for torque control of an internal combustion engine as a function of exhaust smoke level. 4,601,270, Cl. 123-357.000.

Kimberly-Clark Corporation: *See*—
Sigl, Wayne C.; Endres, Dan D.; and Habert, Christine C., 4,601,065, Cl. 2-49.00R.

Kimble, Kenneth B.: *See*—
Bresson, Clarence R.; and Kimble, Kenneth B., 4,601,818, Cl. 209-166.000.

Kimura, Kazuaki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Encoder for photoelectric measuring devices. 4,602,242, Cl. 340-347.00P.

Kimura, Teruaki: *See*—
Hirose, Minoru; and Kimura, Teruaki, 4,602,332, Cl. 364-408.000.
Kinney, Daryl F.: *See*—
Bahr, Richard G.; Kinney, Daryl F.; Nemeth, Alan G.; and Raizen, Helen S., 4,601,586, Cl. 370-94.000.
Kinugasa, Toshiyuki: *See*—
Ando, Yoshio; Kumagai, Shuno; and Kinugasa, Toshiyuki, 4,601,652, Cl. 425-447.000.
Kirchner, Gerald: *See*—
Klibanov, Alexander M.; and Kirchner, Gerald, 4,601,987, Cl. 435-280.000.
Kita, Nobuyuki; Matsumoto, Hiroshi; and Imai, Masanori, to Fuji Photo Film Co., Ltd. Desensitizing gum for lithographic printing. 4,601,974, Cl. 430-309.000.
Kitagawa, Junji; Akita, Shigeyuki; and Yamanoue, Kouichi, to Nippon Soken, Inc. Luggage door unlocking device for vehicle. 4,602,255, Cl. 340-825.690.
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Kitahara, Tsuyoshi, to Nissan Motor Co., Ltd. Oxygen concentration detecting system using oxygen sensor including oxygen ion pump. 4,601,809, Cl. 204-406.000.
Kitazawa, Koji: *See*—
Fujii, Tadaomi; Kitazawa, Koji; Tomono, Yutaka; Takagi, Tomio; and Kawachi, Josuke, 4,601,877, Cl. 419-42.000.
Kitchen, John A. Pulse combustion apparatus. 4,601,654, Cl. 431-1.000.
KitchenAid, Inc.: *See*—
Stottmann, Richard L.; Ponikwia, Edward F.; and Weigl, William, 4,601,429, Cl. 241-92.000.
Kitou, Shigehiro: *See*—
Fijiwara, Keiji; Shinoda, Takaaki; Kitou, Shigehiro; and Kawabe, Suenobu, 4,601,736, Cl. 55-479.000.
Kleemann, Axel: *See*—
Karrenbauer, Michael; and Kleemann, Axel, 4,602,096, Cl. 548-498.000.
Klein, Gerhart P. Contoured chair. 4,601,516, Cl. 297-441.000.
Klett, Gene R., to Caterpillar Tractor Co. Corner tooth for a bucket. 4,601,119, Cl. 37-141.00T.
Kleykamp, Donald L., to Dayco Corporation. Holddown bar for a hatch cover of a railroad car. 4,601,245, Cl. 105-377.000.
Klibanov, Alexander M.; and Kirchner, Gerald, to Massachusetts Institute of Technology. Enzymatic production of optical isomers of 2-halopropionic acids. 4,601,987, Cl. 435-280.000.
Kline, Mark L.: *See*—
Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., 4,601,493, Cl. 285-53.000.
Klingler, Otto; and Ross, Gunther, to Mauser-Werke Oberndorf GmbH. Measuring process for the inspection of turned parts finished on both sides thereof and installation for implementing the process. 4,601,109, Cl. 33-517.000.
Klockner-Humboldt-Deutz AG - Zweigniederlassung Fahr: *See*—
Wessel, Ulrich, 4,601,162, Cl. 56-13.600.
Klocksiem, Howard W. Buoyant marking device for fishermen. 4,601,126, Cl. 43-17.500.
Kluger, Edward W.: *See*—
Keller, Margaret S.; and Kluger, Edward W., 4,601,725, Cl. 8-403.000.
Knebl, Leslie F.; and Lewis, Ramola, to Warner-Lambert Company. Chewy confection. 4,601,907, Cl. 426-5.000.
Kneip, George D., Jr.; Broshear, John H.; and Anderson, Marvin H., to Varian Associates, Inc. Reduction of water condensation on neck tubes of cryogenic containers. 4,601,175, Cl. 62-50.000.
Knobeloch, Marcia L. Lounging/sleeping apparatus. 4,601,076, Cl. 5-413.000.
Knuth, Howard D.: *See*—
Allen, Donald E.; Gross, Richard A.; and Knuth, Howard D., 4,601,915, Cl. 427-96.000.
Kobayashi, Kazuhiro: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Ishikawa, Masao; Kon, Masahiko; and Kuse, Satoru, 4,601,975, Cl. 430-393.000.
Kobayashi, Kazuo: *See*—
Suzuki, Akira; Kobayashi, Kazuo; and Enoki, Sigekazu, 4,601,967, Cl. 430-107.000.
Takahashi, Michio; Tanaka, Mitsuo; Kanno, Fuchio; and Kobayashi, Kazuo, 4,601,963, Cl. 430-69.000.
Kobayashi, Masao: *See*—
Kadota, Otomatsu; and Kobayashi, Masao, 4,601,470, Cl. 273-142.00E.
Kobayashi, Toshio: *See*—
Teraoka, Masao; and Kobayashi, Toshio, 4,601,217, Cl. 74-701.000.
Kobler, Ingo, to M.A.N. ROLAND Druckmaschinen Aktiengesellschaft. Transport path for paper products with speed reduction, particularly for printing machinery in combination with folding apparatus. 4,601,387, Cl. 198-626.000.
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Ishikawa, Masao; Kon, Masahiko; and Kuse, Satoru, to Konishiroku Photo Industry Co., Ltd. Method for processing light-sensitive silver halide color photographic material. 4,601,975, Cl. 430-393.000.
Koch, Christopher E.: *See*—
More, Henry S.; and Koch, Christopher E., 4,601,100, Cl. 29-885.000.
Koch Engineering Company, Inc.: *See*—
Michelson, Ilya, 4,601,731, Cl. 55-1.000.
Kodaira, Takanori: *See*—
Miyawaki, Makoto; Hirohata, Michio; Ogawa, Yukio; and Kodaira, Takanori, 4,601,563, Cl. 354-195.100.
Koelsch, Peter M.: *See*—
Musser, Arlene K.; and Koelsch, Peter M., 4,601,532, Cl. 350-1.100.
Koffron, Robert J. Vortex inhibitor for molten metal discharge. 4,601,415, Cl. 222-597.000.
Kofod, Hans: *See*—
Andresen, Finn H.; Balschmidt, Per; Hejnos, Kim R.; and Kofod, Hans, 4,601,979, Cl. 435-70.000.
Kogler, Charles R.: *See*—
Miller, Brian M.; and Kogler, Charles R., 4,602,225, Cl. 332-19.000.
Koike, Hideharu, to Tokyo Shibaura Denki Kabushiki Kaisha. High speed driving circuit. 4,602,269, Cl. 357-42.000.
Koizumi, Rikihachiro, to Kabushiki Kaisha Hanzawa Corporation. Toy motorcycle. 4,601,674, Cl. 446-440.000.
Kolbl, Georg: *See*—
Engelhardt, Ernst; and Kolbl, Georg, 4,601,306, Cl. 137-91.000.
Kolitsch, Jorg, to Bayerische Motoren Werke Aktiengesellschaft. Torsional test stand. 4,601,198, Cl. 73-118.000.
Kollmorgen Technologies Corporation: *See*—
Arachtingi, James J., 4,601,916, Cl. 427-97.000.
Lassen, Charles L., 4,602,318, Cl. 361-414.000.
Komaki, Takao: *See*—
Asai, Eiichi; Komaki, Takao; and Adachi, Yuma, 4,602,156, Cl. 250-327.200.
Kominami, Seiya: *See*—
Asayama, Yoshiaki; and Kominami, Seiya, 4,601,793, Cl. 204-1.00T.
Komori, Tomoyasu, to Kabushiki Kaisha Toshiba. Storage of image data in both original and compressed forms. 4,602,333, Cl. 364-414.000.
Kon, Masahiko: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Ishikawa, Masao; Kon, Masahiko; and Kuse, Satoru, 4,601,975, Cl. 430-393.000.
Kondo, Ryuji; and Tisue, J. Gilbert, to Fuji Photo Film Co., Ltd. MOS-type image sensor with branch readout. 4,602,290, Cl. 358-213.000.
Kondoh, Shiroh, to Ricoh Company, Ltd. Electrophotographic developing device having toner removing means. 4,601,258, Cl. 118-652.000.
Konishi, Toshio: *See*—
Hayashi, Tauneyuki; Yamauchi, Manabu; Tago, Kazuhide; Konishi, Toshio; and Hirai, Shinji, 4,601,433, Cl. 242-4.00R.
Konishiroku Photo Industry Co., Ltd.: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Ishikawa, Masao; Kon, Masahiko; and Kuse, Satoru, 4,601,975, Cl. 430-393.000.
Moroboshi, Yasuo; and Nishiwaki, Akira, 4,601,922, Cl. 427-248.100.
Yoneyama, Saburo; Fujita, Masami; Ishii, Shizuo; Kichima, Mutsuhito; Takahashi, Yoshiharu; and Sameshima, Yoshinobu, 4,601,562, Cl. 354-170.000.
Konotsune, Shiro; Higashi, Hiromi; Wada, Masami; Maehara, Hiroshi; and Tsuji, Kazuyuki, to Chisso Corporation. Silicon-containing step ladder polymer and a process for producing the same. 4,602,065, Cl. 525-326.500.
Koopmann, Adolf: *See*—
Hofmann, Wilfried; Holzmann, Andreas; Koopmann, Adolf; Meggendorfer, Ruth; and Sylla, Jurgen, 4,601,558, Cl. 353-27.00R.
Kopczynski, John F. Method of assembling a plate-fin heat exchanger. 4,601,088, Cl. 29-157.30R.
Koppel Aktiengesellschaft: *See*—
Heine, Franz; and Kowalewski, Manfred, 4,601,626, Cl. 414-687.000.
Korlatzki, Rudi: *See*—
Erk, Gayyur; and Korlatzki, Rudi, 4,601,929, Cl. 428-36.000.
Kotler, George A.: *See*—
Shaw, Herbert J.; Bergh, Ralph A.; and Kotler, George A., 4,601,541, Cl. 350-320.000.
Kotter, Clemens: *See*—
Westermann, Jurgen; Boroschewski, Gerhard; Eder, Ulrich; Arndt, Friedrich; Krahmer, Hansjorg; and Kotter, Clemens, 4,601,746, Cl. 71-92.000.
Kourtides, Demetrius A.: *See*—
Mikroyannidis, John A.; and Kourtides, Demetrius A., 4,602,081, Cl. 528-337.000.
Kovacs, Ferenc: *See*—
David, Agoston; Kovacs, Ferenc; and Pogany, Janos, 4,601,866, Cl. 264-109.000.
Kowalewski, Manfred: *See*—
Heine, Franz; and Kowalewski, Manfred, 4,601,626, Cl. 414-687.000.
Koyama, Hiroshi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Microcomputer addressing system and electronic timepiece utilizing the same. 4,602,347, Cl. 364-569.000.
Kozuka, Hajime; and Yoshida, Hiroshi, to Mitsubishi Jidoshi Kogyo Kabushiki Kaisha. Power steering system. 4,601,358, Cl. 180-141.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Gebald, Georg; Rohrich, Heinz; Dippold, Clemens; and Forner, Siegfried, 4,601,133, Cl. 51-135.00R.
Krahmer, Hansjorg: *See*—
Westermann, Jurgen; Boroschewski, Gerhard; Eder, Ulrich; Arndt, Friedrich; Krahmer, Hansjorg; and Kotter, Clemens, 4,601,746, Cl. 71-92.000.
Kral, Vaclav. Carpet tape stripper. 4,601,776, Cl. 156-584.000.

Krantz, Alexander; Tam, Tim F.; and Spencer, Robin W., to Syntex (U.S.A.) Inc. Ynenolactone protease inhibitors. 4,602,006, Cl. 514-63.000.

Krass, James E., Jr.: *See*—
Neely, James F.; and Krass, James E., Jr., 4,602,127, Cl. 179-2.00A.

Kraus, Thomas W., to Foxboro Company, The. Pattern-recognizing self-tuning controller. 4,602,326, Cl. 364-158.000.

Krawagna, Alois, to Creanova AG. Snap-acting spring device. 4,601,413, Cl. 222-498.000.

Kreft, Hans-Dietrich, to Angewandte Digital Elektronik GmbH. Apparatus for mutual information transmission in a lock and key system. 4,602,253, Cl. 340-825.310.

Kress Corporation: *See*—
Kress, Edward S.; Thomas, Dennis R.; and LaBerdia, William L., 4,601,630, Cl. 414-460.000.

Kress, Edward S.; Thomas, Dennis R.; and LaBerdia, William L., to Kress Corporation. Load handling apparatus. 4,601,630, Cl. 414-460.000.

Kreutzfeldt, Richard: *See*—
Ebert, Hildegard; and Kreutzfeldt, Richard, 4,601,908, Cl. 426-52.000.

Krihsnakumar, Suppayan M.: *See*—
Harry, Ieuan L.; Krihsnakumar, Suppayan M.; Jolly, Walter R.; and Beck, Martin H., 4,601,869, Cl. 264-523.000.

Krimsky, Leonard C., to Worldwide Converting Machinery, Inc. Coanda nozzle dryer. 4,601,116, Cl. 34-156.000.

Kristiansen, Odd; and Drabek, Jozef, to Ciba-Geigy Corporation. Phenylbenzoylureas useful as pesticides. 4,602,021, Cl. 514-336.000.

Krogh, James A., to PPG Industries, Inc. Method for producing selenoethers from selenoalcohols or their salts, and carbonates. 4,601,860, Cl. 260-550.000.

Kronich, Peter G., to Tecumseh Products Company. Valve mechanism lubrication system for an overhead valve engine. 4,601,267, Cl. 123-90.330.

Krsek, George, to Progenics, Inc. Alkylated etiocholanolones and use as an anti-diabetic, anti-obesity and erythropoietic agent. 4,602,008, Cl. 514-178.000.

Kruger, Hans-Rudolf; and Arndt, Friedrich, to Schering Aktiengesellschaft. 2-phenoxy propionic acid derivatives of pentite, process for the production of these compounds as well as compositions containing the same having herbicidal effectiveness. 4,601,748, Cl. 71-94.000.

Krulik, Gerald, to Morton Thiokol, Inc. High concentration sodium permanganate etch batch and its use in desmearing and/or etching printed circuit boards. 4,601,783, Cl. 156-655.000.

Krulik, Gerald, to Morton Thiokol, Inc. Sodium permanganate etch baths containing a co-ion for permanganate and their use in desmearing and/or etching printed circuit boards. 4,601,784, Cl. 156-655.000.

Kubo, Masayoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for supplying bead portion in tire-forming machine. 4,601,773, Cl. 156-403.000.

Kubota, Yuichi: *See*—
Shimada, Shigeru; Kubota, Yuichi; and Nishimatsu, Masaharu, 4,601,947, Cl. 428-336.000.

Kudo, Tsutomu: *See*—
Okonogi, Shigeo; Ono, Jyoji; Kudo, Tsutomu; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,601,985, Cl. 435-253.000.

Kufner Textilwerke GmbH: *See*—
Hefele, Josef, 4,602,057, Cl. 524-300.000.

Kugimoto, Junichi: *See*—
Sakamoto, Nagayoshi; and Kugimoto, Junichi, 4,601,889, Cl. 423-7.000.

Kuhle, Engelbert: *See*—
Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,602,033, Cl. 514-452.000.

Kumagai, Shuno: *See*—
Ando, Yoshio; Kumagai, Shuno; and Kinugasa, Toshiyuki, 4,601,652, Cl. 425-447.000.

Kumahira Safe Co. Inc: *See*—
Nishikawa, Makoto; and Tanaka, Minoru, 4,602,150, Cl. 235-382.000.

Kumaki, Takashi; and Saito, Takashi, to Victor Company of Japan, Limited. Apparatus for playing back rotating recording mediums. 4,602,361, Cl. 369-77.200.

Kumashiro, Hatuyoshi: *See*—
Kaneko, Hideo; Kumashiro, Hatuyoshi; and Iwata, Akira, 4,601,327, Cl. 164-502.000.

Kunkel, Lorenz V.: *See*—
Palm, John W.; and Kunkel, Lorenz V., 4,601,330, Cl. 165-95.000.

Kunreuther and Beringhause: *See*—
Kunreuther, Steven J., 4,601,417, Cl. 223-85.000.

Kunreuther, Steven J., to Kunreuther and Beringhause. Hosiery tag. 4,601,417, Cl. 223-85.000.

Kunz, Raymond W.: *See*—
Barns, Ileana D.; Kunz, Raymond W.; Montagnino, James G.; and Morrison, Herbert M., 4,602,146, Cl. 219-373.000.

Kunzli, Roland; and Rydstad, Hans, to BBC Brown, Boveri & Co., Ltd. Process and apparatus for achieving narrow workpiece tolerances in drop-forging, especially in isothermal forging. 4,601,186, Cl. 72-21.000.

Kuo, Hsien-Ching: *See*—
Huang, Chung-Siung; and Kuo, Hsien-Ching, 4,601,254, Cl. 116-34.00R.

Kurahashi, Kazuo; and Onodera, Nobutoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Composite material for decorative applications. 4,601,955, Cl. 428-614.000.

Kurihara, Takenori, to Advantest Corp. Variable frequency synthesizer with reduced phase noise. 4,602,220, Cl. 331-19.000.

Kurogo, Haruji, to Tokyo Sangyo Kabushiki Kaisha. Burner tip. 4,601,428, Cl. 239-427.300.

Kurokawa, Naohiro, to Hitachi, Ltd. Programmable controller. 4,602,325, Cl. 364-140.000.

Kurono, Takehiro; Tsuchiya, Yutaka; Inuzuka, Eiji; and Hiruma, Teruo, to Hamamatsu Photonics Kabushiki Kaisha. Measuring devices for two-dimensional photon-caused or corpuscular-ray-caused image signals. 4,602,282, Cl. 358-110.000.

Kuroyanagi, Masatoshi; Suzuki, Masahiko; and Iwata, Hiroshi, to Nippondenso Co. Ltd. Discharge pressure-dependant variable-capacity radial plunger pump. 4,601,641, Cl. 417-220.000.

Kurumaji, Masanobu: *See*—
Amano, Itaru; Kurumaji, Masanobu; Misumi, Shikao; Fujieda, Yasuhiko; and Kanzawa, Masahide, 4,601,648, Cl. 425-47.000.

Kurz, Gerhard. Vacuum cleaner. 4,601,082, Cl. 15-319.000.

Kuse, Satoru: *See*—
Koboshi, Shigeharu; Kobayashi, Kazuhiro; Ishikawa, Masao; Kon, Masahiko; and Kuse, Satoru, 4,601,975, Cl. 430-393.000.

Kush, Donald C.; and Hust, Gary A., to Kaiser Aluminum & Chemical Corporation. Liquid edgebead removal device. 4,601,112, Cl. 34-9.000.

Kuwabara, Hideki: *See*—
Akiyama, Hiroyuki; Izawa, Susumu; and Kuwabara, Hideki, 4,602,082, Cl. 528-481.000.

Kuwabara, Kouji: *See*—
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,602,372, Cl. 372-58.000.

Kuznetsov, Stephen B.; and Kilgore, Lee A., to Westinghouse Electric Corp. Homopolar dynamoelectric machine with an auxiliary field coil. 4,602,179, Cl. 310-178.000.

L. Schuler GmbH: *See*—
Schneider, Franz; Pfeifle, Peter; and Michael, Wolfgang, 4,601,190, Cl. 72-347.000.

La Telemecanique Electrique: *See*—
Gaude, Maurice, 4,602,309, Cl. 361-210.000.

Labelette Company: *See*—
Wesley, James G., 4,601,771, Cl. 156-215.000.

LaBerdia, William L.: *See*—
Kress, Edward S.; Thomas, Dennis R.; and LaBerdia, William L., 4,601,630, Cl. 414-460.000.

Ladin, Eli M., to Federal-Mogul Corporation. Hydraulic clutch piston and seal. 4,601,374, Cl. 192-85.0CA.

Lai, John T., to B. F. Goodrich Company, The. Stabilized polymers, novel stabilizers, and synthesis thereof. 4,601,839, Cl. 252-51.50A.

Lais, Edgar H., to Global Gym & Fitness Equipment Limited. Exercise weight. 4,601,466, Cl. 272-118.000.

Lake Shore, Inc.: *See*—
Lehmann, Richard P., 4,601,607, Cl. 405-133.000.

Lamain, Henri: *See*—
Doucet, Henri J.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,602,376, Cl. 378-119.000.

Lambert, Pierre M.; and De Aguirre-Otegui, Ignacio, to Societe Carbochimique en abrege "CARBOCHIM". Organic salts of polyisocyanate derivatives and the preparation thereof. 4,602,080, Cl. 528-67.000.

Lamy, Pierre: *See*—
Doucet, Maurice; and Lamy, Pierre, 4,601,323, Cl. 164-312.000.

Lancaster, Gerald M.; and Allen, James A., to Dow Chemical Company, The. High-frequency heatable plastics. 4,601,948, Cl. 428-349.000.

Lane, William L.; and Lewis, Donald L. Rockbolt. 4,601,614, Cl. 405-261.000.

Laneus, Per, to JCC Johnson Construction Company AB. Method of excavating rock caverns by blasting. 4,601,518, Cl. 299-13.000.

Lang, George R.: *See*—
Kelman, Arnold L.; Prendergast, John F.; Stevens, Edward P.; and Lang, George R., 4,602,378, Cl. 378-26.000.

Lang, Gusztav; Leibhard, Erich; and Froehlich, Peter, to Hilti Aktiengesellschaft. Method of producing an expansion sleeve for a metallic expansion dowel assembly. 4,601,192, Cl. 72-377.000.

Lange, Dennis J.: *See*—
Bianchi, Jacqueline K.; Gdula, Robert A.; and Lange, Dennis J., 4,601,782, Cl. 156-643.000.

Langenfeld, Joseph W.; and Westendorf, Neal W., to Westendorf Manufacturing Company, Inc. Cylinder strain relief linkage for a loader device for a tractor or the like. 4,601,634, Cl. 414-697.000.

Langenhorst, Christoph, to Walpat AG. Method of and tool for mitering frame members. 4,601,189, Cl. 72-326.000.

Langer, Heimo J.: *See*—
Dunnavant, William R.; Gardikes, John J.; and Langer, Heimo J., 4,602,069, Cl. 525-504.000.

Langston, Jimmy B.: *See*—
Wong, Patrick S. L.; Langston, Jimmy B.; and Leeper, Harold M., 4,601,880, Cl. 422-28.000.

Lantzsch, Reinhard, to Bayer Aktiengesellschaft. Process for the preparation of halogenated 3,3-dimethyl-5-hexen-2-ones. 4,602,117, Cl. 568-393.000.

LaPlante, Dale, to BEI Electronics, Inc. Zero reference generating method and apparatus for optical encoders. 4,602,155, Cl. 250-231.0SE.

Larkai, Samuel K. L.: *See—*
Bailes, Philip J.; and Larkai, Samuel K. L., 4,601,834, Cl. 210-748.000.

Larkin, John M., to Texaco Inc. Conversion of polyvinyl alcohol to acrylic acid polymer. 4,602,062, Cl. 525-61.000.

Larkin, Mark E., to Abbott Laboratories. Container mixing system with externally mounted drug container. 4,601,704, Cl. 604-87.000.

Larsson, Nils F., to AB Electrolux. Electric rotating device. 4,602,178, Cl. 310-71.000.

Lasky, Jerome B.: *See—*
Abernathey, John R.; Lasky, Jerome B.; Nesbit, Larry A.; Sedgwick, Thomas O.; and Stiffler, Scott; R., 4,601,779, Cl. 156-628.000.

Lassen, Charles L., to Kollmorgen Technologies Corporation. Substrates to interconnect electronic components. 4,602,318, Cl. 361-414.000.

Lassiaz, Philippe: *See—*
Renaud, Pierre; and Lassiaz, Philippe, 4,601,379, Cl. 192-89.00B.

Lattion, Andre : *See—*
Bischofberger, Jurg; and Lattion, Andre , 4,601,164, Cl. 57-263.000.

Latussek, Eberhard, to Akzona Incorporated. Temporary compaction of fiber non-wovens. 4,601,937, Cl. 428-132.000.

Lau, Hon C.; and O'Brien, Stephen M., to Shell Oil Company. Foam drive oil displacement with outflow pressure cycling. 4,601,337, Cl. 166-263.000.

Lavering, Gordon R.: *See—*
Kessler, Sebastian W., Jr.; and Lavering, Gordon R., 4,601,331, Cl. 165-104.330.

LaViolette, William P.; Mothersole, David S.; and Zolnowsky, John, to Motorola, Inc. Bus master capable of relinquishing bus on request and retrying bus cycle. 4,602,327, Cl. 364-200.000.

Lawson, John D. Suspended hopper bin flow enhancer. 4,601,414, Cl. 222-564.000.

Layton, Richard G.: *See—*
Caple, Gerald; and Layton, Richard G., 4,601,842, Cl. 252-70.000.

Le, Quang N.: *See—*
Oleck, Stephen M.; Le, Quang N.; and Neuman, Daniel J., 4,601,998, Cl. 502-318.000.

Leary, David J.: *See—*
Barnes, James O.; and Leary, David J., 4,601,914, Cl. 427-87.000.

Leason, Hayden, to Filtertek, Inc. Low-profile inline filter. 4,601,820, Cl. 210-94.000.

LeBlanc, Richard S., to General Motors Corporation. Weapon system. 4,601,230, Cl. 89-1.200.

Le Bozec, Francois: *See—*
Fournot, Bernard; Le Bozec, Francois; and Rouland, Daniel, 4,601,204, Cl. 73-432.00R.

Lee, Albert P.: *See—*
Gati, George S.; Lee, Albert P.; Schwartz, Geraldine C.; and Standley, Charles L., 4,601,939, Cl. 428-161.000.

Lee, Hsai-Yin, to General Motors Corporation. Method and apparatus for spraying coating material. 4,601,921, Cl. 427-240.000.

Lee, Peter W.: *See—*
Jatczak, Chester F.; Lee, Peter W.; and Orvos, Peter S., 4,601,592, Cl. 384-564.000.

Leeper, Harold M.: *See—*
Wong, Patrick S. L.; Langston, Jimmy B.; and Leeper, Harold M., 4,601,880, Cl. 422-28.000.

Legille, Edouard; Ulveling, Leon; and Mailliet, Pierre, to Paul Wurth S.A. Device for introducing dosed quantities of pulverized solid materials into a carrier gas stream. 4,601,617, Cl. 406-129.000.

Lehman, Philip: *See—*
Soulliard, Charles; Kelly, Kevin; and Lehman, Philip, 4,602,131, Cl. 179-84.0VF.

Lehmann, Richard P., to Lake Shore, Inc. Mine shaft guide system. 4,601,607, Cl. 405-133.000.

Leibhard, Erich: *See—*
Lang, Gusztav; Leibhard, Erich; and Froehlich, Peter, 4,601,192, Cl. 72-377.000.

Leinonen, Pertti, to Suunto Oy. Vibration attenuator. 4,601,106, Cl. 33-356.000.

Leland Stanford Junior University, The Board of Trustees of: *See—*
Shaw, Herbert J.; Bergh, Ralph A.; and Kotler, George A., 4,601,541, Cl. 350-320.000.

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Leroux, Patrick: *See—*
Dupin, Thierry; Caillod, Jacques; Leroux, Patrick; and Martino, Germain, 4,602,000, Cl. 502-335.000.

Les Cables de Lyon: *See—*
Guazzo, Lucien, 4,601,536, Cl. 350-96.200.

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Morris, Norman, 4,601,601, Cl. 403-359.000.

L'Etat Francais represente par le Ministre des P.T.T. (Centre National d'Etudes des Telecommunications): *See—*
Finger, Ulrich; Ligneres, Pierre; and O'Donnell, Ciaran, 4,602,328, Cl. 364-200.000.

Lethellier, Patrice R., to Burroughs Corporation. Single-ended transformer drive circuit. 4,602,323, Cl. 363-131.000.

Leumann, Hans E.: *See—*
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Lever Brothers Company: *See—*
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Namnath, James S., 4,601,845, Cl. 252-99.000.

Levin, William J. Flexible illuminated display. 4,601,120, Cl. 40-317.000.

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Georgopoulos, George, 4,601,319, Cl. 160-178.00B.

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Lewis, Arthur E.; Braun, Robert L.; Mallon, Richard G.; and Walton, Otis R., to United States of America, Energy. Process for oil shale retorting using gravity-driven solids flow and solid-solid heat exchange. 4,601,811, Cl. 208-410.000.

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LGZ Landis & Gyr Zug AG: *See—*
Stratil, Tomas; Pisinger, Milos; and Fehr, Peter, 4,601,763, Cl. 148-23.000.

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Liepold, August: *See—*
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Limberg, Allen L.: *See—*
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Lin, Jiang-Jen, to Texaco Inc. Preparation of enamines from conjugated dienes. 4,602,088, Cl. 544-178.000.

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Valcho, Joseph J.; Lindberg, Steven E.; Hunt, Mack W.; and Sabol, Albert R., 4,601,837, Cl. 252-40.700.

Lindenbaum, Bernard. Aerial load-lifting system. 4,601,444, Cl. 244-26.000.

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Lindner, Georg H.: *See—*
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Lipha, Lyonnaise Industrielle Pharmaceutique: *See—*
Bruet, Philippe; Berthelon, Jean-Jacques; and Collonges, Francois, 4,602,034, Cl. 514-456.000.

Liqui-Box Corporation: *See—*
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Liu, Chao-Min; Tresner, Homer D.; and Westley, John, to Hoffmann-La Roche Inc. Process to produce antibiotics X-14873 A, G and H. 4,601,984, Cl. 435-119.000.

Liu, Wen-Chih: *See—*
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Ljung, Erik A.: *See—*
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Lloyd, Robert D.; Holden, Irving H.; and Brinkley, Gerald E., to Motorola, Inc. Static protective housing. 4,602,311, Cl. 361-212.000.

Lo, John C.; and Lu, Neng-hsing, to International Business Machines Corporation. Reactor for plasma desmear of high aspect ratio hole. 4,601,807, Cl. 204-298.000.

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LOF Plastics Inc.: *See—*
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Losapio, Peter F.; and Germer, Warren R., to General Electric Co. Multiple external control actuator for electronic demand register. 4,602,211, Cl. 324-103.00R.

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Lovegrove, Peter J., to Weatherford/Lamb, Inc. Control line protector for oil well tubing string. 4,601,334, Cl. 166-241.000.

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Lowe, Steven P., Sr.: *See—*
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Lowing, Michael M. Storage structures. 4,601,628, Cl. 414-250.000.

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Lucht Engineering, Inc.: *See—*
Bartz, Stephen A.; and Gunderson, Wayne D., 4,601,570, Cl. 355-27.000.

Luck, Ronald H.: *See—*
Steadman, Michael; and Luck, Ronald H., 4,601,228, Cl. 83-862.000.

Luckers, John, to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Method of measuring the water content of charges in a shaft furnace. 4,601,658, Cl. 432-37.000.

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Ludwig, Jurgen: *See—*
Obermeier, Rainer; Ludwig, Jurgen; and Seipke, Gerhard, 4,601,852, Cl. 530-303.000.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Reik, Wolfgang, 4,601,376, Cl. 192-89.00B.

Luke, John A.; and Sugars, David E., to British-American Tobacco Company Limited. Production of tobacco-smoke filters. 4,601,686, Cl. 493-43.000.

Lukewille, Heinrich: *See—*
Friedel, Franz; Fruhauf, Werner; Harms, Gunter; Heise, Georg; and Lukewille, Heinrich, 4,601,442, Cl. 244-3.240.

Luthi, Christian; Meyer, Hans R.; and Weber, Kurt, to Ciba-Geigy Corporation. Distyrylbiphenyls. 4,602,087, Cl. 544-78.000.

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Lutz, Robert G.; and Gergen, William P., to Shell Oil Company. High heat metal-polymer laminate. 4,601,941, Cl. 428-213.000.

Lynch, Brian; and O'Brien, William D., Jr., to AT&T Technologies, Inc. Methods of and apparatus for at least partially closing an end portion of an optical preform tube. 4,601,740, Cl. 65-2.000.

Lynch, Robert C.: *See—*
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Lyon, Lyman R., to Microdot Inc. Fastener. 4,601,622, Cl. 411-311.000.

Lyons, James E., to Sun Refining and Marketing Company. Process for the oxidation of butenes to linear acetates. 4,602,103, Cl. 560-243.000.

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Rastogi, Prabhat K.; and Lyudkovsky, Grigory, 4,601,766, Cl. 148-111.000.

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M.C.L. Co., Ltd.: *See—*
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M&T Chemicals Inc.: *See—*
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Maag Gear-Wheel & Machine Company, Ltd.: *See—*
Berchtold, Nikolaus, 4,601,111, Cl. 33-559.000.

MacDermid, Incorporated: *See—*
Barber, Loren L., Jr., 4,601,847, Cl. 252-312.000.

Machida Endoscope Co., Ltd.: *See—*
Chikama, Toshio, 4,601,283, Cl. 128-4.000.

Maciejewski, Boguslaw: *See—*
Blauhut, Reinhold; and Maciejewski, Boguslaw, 4,601,193, Cl. 73-35.000.

Mack, William; and Santhouse, Daniel, to Clairol Incorporated. Infrared hair styling device. 4,602,143, Cl. 219-225.000.

MacMillan Bloedel Limited: *See—*
Gillard, David F., 4,601,407, Cl. 220-443.000.

MacRae, Alfred U.: *See—*
Hartman, Adrian R.; MacRae, Alfred U.; and Shackle, Peter W., 4,602,268, Cl. 357-38.000.

Mactaggart, John W., to Sentrol Systems Ltd. Infrared constituent analyzer and control system. 4,602,160, Cl. 250-341.000.

Maddock, Brian, to Alform Alloys Limited. Extrusion. 4,601,325, Cl. 164-476.000.

Maeda, Yoshimi, to Shimano Industrial Company Limited. Fishing rod and a manufacturing method therefor. 4,601,127, Cl. 43-18.500.

Maehara, Hiroshi: *See—*
Konotsune, Shiro; Higashi, Hiromi; Wada, Masami; Maehara, Hiroshi; and Tsuji, Kazuyuki, 4,602,065, Cl. 525-326.500.

Maenaka, Tomio: *See—*
Awata, Takashi; Maenaka, Tomio; and Kawamatsu, Yutaka, 4,602,026, Cl. 514-369.000.

Mahrt, David M. Mixing and drop system for fire retardants. 4,601,345, Cl. 169-53.000.

Mailliet, Pierre: *See—*
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Major Lock, Corp.: *See—*
Wolf, Ralph C., 4,601,504, Cl. 292-334.000.

Makauskas, Walter J.: *See—*
Swearengen, Thomas F.; and Makauskas, Walter J., 4,601,123, Cl. 42-72.000.

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Mallon, Richard G.: *See—*
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Malmeblad, Sven-Erik: *See—*
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,601,786, Cl. 162-30.100.

Malmi, Jarmo: *See—*
Tomma, Kauko; and Malmi, Jarmo, 4,601,435, Cl. 242-56.400.

Maloomian, Laurence G. Weight and/or measurement reduction preview system. 4,602,280, Cl. 358-93.000.

Mammolenti, Joseph; and Oberhardt, Bruce J., to Miles Laboratories, Inc. Long indwelling double bore catheter. 4,601,697, Cl. 604-43.000.

Mangels Industrial S.A.: *See—*
Sobolewski, Antoni, 4,602,140, Cl. 219-10.510.

Manitowoc Company, Inc., The: *See—*
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Manning Technologies, Inc.: *See—*
Brown, Alvin E., 4,601,210, Cl. 73-861.270.

Mantec Gesellschaft fur Automatisierungs- und Handhabungssysteme mbH: *See—*
Eberle, Manfred; and Hartmann, Rudolf-Peter, 4,602,195, Cl. 318-568.000.

Marcotti, Ettore. Flagpole device. 4,601,255, Cl. 116-173.000.

Marcq, Gilbert, to Massey-Ferguson Services N.V. Tractor hitch. 4,601,486, Cl. 280-460.00A.

Mardon Illingworth Ltd: *See—*
Dudzik, Henryk, 4,601,406, Cl. 220-66.000.

Mares, Frank: *See—*
Galle, James E.; Mares, Frank; Diamond, Steven E.; Corsi, Jeffrey; and Regina, Francis J., 4,601,859, Cl. 558-459.000.

Mark Sensing (Aust.) Pty. Limited: *See—*
Philpott, Arthur K.; and Poole, Gordon H., 4,602,265, Cl. 346-210.000.

Markus, Michael V.; and Barnett, George H., to ICI Australia Limited. Cation-exchange resins and use as membranes in electrolytic cells. 4,602,045, Cl. 521-27.000.

Mars Incorporated: *See—*
Dean, Robert; Reyner, Peter J.; and Hutchinson, Derek, 4,601,380, Cl. 194-318.000.

Marsh, Theodore A.: *See—*
Beaulier, Daniel A.; and Marsh, Theodore A., 4,602,285, Cl. 358-160.000.

Martell, William A.; and Weiss, Ladislaus, to General Motors Corporation. Method of making cast-to-size epoxy tools for stamping sheet metal panels. 4,601,867, Cl. 264-227.000.

Martin, Donald E., to Rexnord Inc. Polymeric grease gun. 4,601,412, Cl. 222-256.000.

Martinez, Jose L. T.: *See—*
van Rooden, Bernardus J. M. S.; and Martinez, Jose L. T., 4,602,059, Cl. 524-521.000.

Martino, Germain: *See—*
Dupin, Thierry; Caillod, Jacques; Leroux, Patrick; and Martino, Germain, 4,602,000, Cl. 502-335.000.

Marty, Michel; Octor, Henri; and Walder, Andre , to Office National d'Etudes et de Recherche Aerospatiales (ONERA). Process for forming a titanium base alloy with small grain size by powder metallurgy. 4,601,874, Cl. 419-23.000.

Marucci, N. Dominic: *See—*
Bertino, Cosmo D., III; and Marucci, N. Dominic, 4,601,664, Cl. 434-264.000.

Maruyama, Akira: *See—*
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Maruyama, Toshinori: *See—*
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Masahiko, Hattori: *See—*
Hiroshi, Namikiri; Takeshi, Tobe; and Masahiko, Hattori, 4,602,086, Cl. 536-125.000.

Masaoka, Toshika: *See—*
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Masoneilan International Inc.: *See—*
Verdelet, Alain B. A., 4,601,459, Cl. 251-306.000.

Massachusetts Institute of Technology: *See—*
Klibanov, Alexander M.; and Kirchner, Gerald, 4,601,987, Cl. 435-280.000.

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Tasaka, Yasuo; Masuda, Sadao; and Sasaki, Kiyoshi, 4,601,328, Cl. 165-12.000.

Mathiprakasam, Balakrishnan, to Midwest Research Institute. Device and method for determining freezing points. 4,601,587, Cl. 374-25.000.

Matoba, Gensuke: *See—*
Shioi, Shunshuke; Matoba, Gensuke; and Miyake, Makoto, 4,602,264, Cl. 346-205.000.
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Matson, Michael S.; and Kahle, Gerald R., to Phillips Petroleum Company. Preparation of ε-caprolactone. 4,602,114, Cl. 549-266.000.

Matsuda, Hiroto; Shibata, Makoto; Ikeda, Masami; and Takahashi, Hiroto, to Canon Kabushiki Kaisha. Ink jet electrode configuration. 4,602,261, Cl. 346-140.00R.

Matsuhashi, Hajime; Maruyama, Toshinori; and Torii, Koshi, to Nippondenso Co., Ltd. Battery voltage regulating system. 4,602,205, Cl. 320-64.000.

Matsuhisa, Tadaaki: *See—*
Oda, Isao; and Matsuhisa, Tadaaki, 4,601,332, Cl. 165-165.000.

Matsui, Hiroshi: *See—*
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Matsui, Mitsuo, to Fanuc Ltd. Measurement method, and apparatus therefor. 4,602,196, Cl. 318-603.000.

Matsumoto, Hiroshi: *See—*
Kita, Nobuyuki; Matsumoto, Hiroshi; and Imai, Masanori, 4,601,974, Cl. 430-309.000.

Matsumoto Kosan Kabushiki Kaisha: *See—*
Takahara, Ichiro; Ono, Tomoyoshi; and Nakai, Makoto, 4,601,588, Cl. 374-106.000.

Matsumoto, Norio: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
Inoue, Toshitsugu; Ishihara, Hiromasa; and Morimoto, Masato, 4,601,216, Cl. 74-640.000.
Kasahara, Yukio; and Inaba, Ritsuo, 4,602,159, Cl. 250-338.000.
Kawakami, Katsura; Shimazaki, Shigeo; and Hirokami, Etsuko, 4,602,346, Cl. 364-518.000.
Nishitani, Yasuo; and Yano, Osahiko, 4,602,298, Cl. 360-14.100.
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Goto, Hidetaka; and Nakamura, Tetsuo, 4,601,463, Cl. 271-19.000.

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Mattel, Inc.: *See—*
Porcelli, Anthony J., 4,602,360, Cl. 369-63.000.

Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., to VMX, Inc. Electronic audio communications system with versatile message delivery. 4,602,129, Cl. 179-18.00B.

Mattson, Gary L., to Xebec. Stepping motor control system. 4,602,197, Cl. 318-696.000.

Mattsson, Lars B. E., to Svenska Vision AB. Telescopic supporting post. 4,601,454, Cl. 248-418.000.

Mauleon, Jean-Louis; and Newman, Robert J., to Total Engineering and Research Company. Method and apparatus for cracking residual oils. 4,601,814, Cl. 208-113.000.

Maurer, Helmut: *See—*
Damson, Eckart; Franke, Horst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,601,276, Cl. 123-489.000.

Maurice, George E. Portable boat dolly. 4,601,481, Cl. 280-47.13B.

Mauser-Werke Oberndorf GmbH: *See—*
Klingler, Otto; and Ross, Gunther, 4,601,109, Cl. 33-517.000.

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Du Be , D. Robert; and May, Lawrence A., 4,601,661, Cl. 433-134.000.

Mayer, Carl W.: *See—*
Hilti, Bruno; and Mayer, Carl W., 4,601,853, Cl. 260-239.00R.

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Cook, Stuart A.; Mayer, John F.; Tucker, David W.; and Smith, William N., 4,601,672, Cl. 446-330.000.

Mazada Motor Corp.: *See—*
Miyoshi, Akihiko; Furutani, Shigeki; Chikuma, Isamu; and Shimada, Satoru, 4,601,357, Cl. 180-140.000.

Mazda Motor Corporation: *See—*
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McAdams, Ronald P.: *See—*
Gore, Albert N., III; Lynch, Robert C.; McAdams, Ronald P.; and Shekita, Gregory A., 4,602,164, Cl. 307-91.000.

MCC Powers: *See—*
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Fertell, Paul A.; McCartney, John; and Robbiati, Giandaniele, 4,601,951, Cl. 428-423.400.

McCartney, Joseph F., to United States of America, Navy. Bilaminar seawater battery. 4,601,961, Cl. 429-119.000.

McClintock, Maurice L. Slide table for power saws. 4,601,226, Cl. 83-415.000.

McClure, Harry A., to Adtech, Inc. Sterilization system. 4,601,885, Cl. 422-114.000.

McConaghy, James R., Jr.: *See—*
Anderson, Ardis L.; and McConaghy, James R., Jr., 4,601,812, Cl. 208-410.000.

McCoy, William C. Steerable and aimable catheter. 4,601,705, Cl. 604-95.000.

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McDonnell Douglas Corporation: *See—*
Coggins, Dolphus L.; and Lindner, Walter E., 4,601,780, Cl. 156-642.000.

McEldowney, Paul A., to Boeing Company, The. Pilot hole locator and drill guide and method. 4,601,618, Cl. 408-1.00R.

McFarland, James H., to LOF Plastics Inc. Conduit spacer anchoring system. 4,601,447, Cl. 248-49.000.

McGill, Kenneth E.; and Gamble, Johnny R., to Tennessee Valley Authority. Production of granular ammonium polyphosphate from wet-process phosphoric acid. 4,601,891, Cl. 423-305.000.

McGowan, Donald A.: *See—*
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McGowan, Thomas F.; Tessner, R. Lynnard; Cassanova, Robert A.; and Bulpitt, William S., to Georgia Tech Research Corporation. Air supply grate and ash removal system for wood gasifier. 4,601,730, Cl. 48-76.000.

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Wise, David S., 4,601,572, Cl. 355-68.000.

McGready, Angus J., to Wilkinson Sword Limited. Razor system. 4,601,101, Cl. 30-40.200.

McGrew, Robert N. Telescoping self-adjusting ossicular prostheses. 4,601,723, Cl. 623-10.000.

McKay, Glen; Smith, Henry F.; Price, Ronald W.; and Keshavjee, Firoz A., to Northern Telecom Limited. Optical fiber proof testing equipment. 4,601,208, Cl. 73-829.000.

McKelvey, Harold E., to Shatterproof Glass Corporation. Apparatus for producing laminated safety glass. 4,601,772, Cl. 156-382.000.

McKenney, Austin L.: *See—*
Plante, Roland L.; and McKenney, Austin L., 4,601,554, Cl. 350-611.000.

McKinnie, Bonnie G., to Ethyl Corporation. Alkyl amine color inhibitor. 4,602,108, Cl. 564-2.000.

McKinnie, Bonnie G.; and Ranken, Paul F., to Ethyl Corporation. (Hydrocarbylthio) phenols and their preparation. 4,602,113, Cl. 568-54.000.

McLeod, Roderick D. Nipple insert. 4,601,494, Cl. 285-110.000.

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Fling, Russell T.; Willis, Donald H.; and McNeely, David L., 4,602,276, Cl. 358-27.000.

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Stotts, Robert E., 4,601,171, Cl. 60-521.000.
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Med Care of Kansas, Incorporated: *See—*
Bragdon, Harold W., 4,602,203, Cl. 320-2.000.

Medical Research Foundation of Oregon: *See—*
Malinow, M. Rene , 4,602,003, Cl. 514-26.000.
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Meeus, Ferdinand F.: *See—*
Huybrechts, Jozef T.; Meeus, Ferdinand F.; and Timmerman, August T., 4,602,053, Cl. 523-436.000.

Meggendorfer, Ruth: *See—*
Hofmann, Wilfried; Holzmann, Andreas; Koopmann, Adolf; Meggendorfer, Ruth; and Sylla, Jurgen, 4,601,558, Cl. 353-27.00R.

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Meier, Hans-Joachim; and Secker, Joachim, to Deutsche Babcock Werke Aktiengesellschaft. Arrangement for the removal of dust from gas standing under pressure. 4,601,734, Cl. 55-269.000.

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Meitzler, Allen H., to Ford Motor Company. Apparatus for applying high frequency ultrasonic energy to cleaning and etching solutions. 4,602,184, Cl. 310-322.000.

Melard, Pierre; Peltier, Marcel; and Tastu, Francis, to Rhone-Poulenc Specialites Chimiques. Cerium based glass polishing compositions. 4,601,755, Cl. 106-3.000.

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Mercier, Jacques S.; and Ho, Vu Q., to Northern Telecom Limited. Method for improving step coverage of dielectrics in VLSI circuits. 4,601,781, Cl. 156-643.000.

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Baldwin, John J.; Ponticello, Gerald S.; and Christy, Marcia E., 4,602,093, Cl. 548-336.000.
Patchett, Arthur A.; and Wu, Mu T., 4,602,002, Cl. 514-11.000.

Merrell Dow Pharmaceuticals Inc.: *See*—
Parker, Roger A., 4,602,099, Cl. 549-479.000.

Merrick, Edwin B., to Hewlett-Packard Company. Transistor rectifier. 4,602,322, Cl. 363-127.000.

Merry, Raymond: *See*—
Jones, Andrew W.; and Merry, Raymond, 4,601,443, Cl. 244-13.000.

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Scherm, Arthur; and Hummel, Klaus, 4,602,037, Cl. 514-512.000.

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Bongers, Bernd, 4,601,367, Cl. 188-376.000.

Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; and Benko, Pal, to Egyt Gyogyszevegyeszeti Gyar. Condensed as-triazine derivatives. 4,602,018, Cl. 514-243.000.

Messmore, Francis B. Cardiac training mannikin. 4,601,665, Cl. 434-267.000.

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Meiller, Hermann, 4,601,514, Cl. 297-284.000.

Metcalf, Fredric D.; and Sommer, John G., to GenCorp Inc. EPDM laminate. 4,601,935, Cl. 428-57.000.

Metex Corporation: *See*—
Usher, Peter P.; and Gavaletz, Eugene J., 4,601,476, Cl. 277-230.000.

Methot, Donald E. Swimming pool coping system. 4,601,073, Cl. 4-506.000.

Meyer, Hans R.: *See*—
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Meyer, Jack E.: *See*—
Thompson, Thomas C.; Gula, John A.; and Meyer, Jack E., 4,601,700, Cl. 604-65.000.

Meyer, Robert B., to AT&T Bell Laboratories. Nematic liquid crystal storage display device. 4,601,542, Cl. 350-334.000.

Meyer, Robert B.: *See*—
Boyd, Gary D.; Cheng, Julian; Meyer, Robert B.; and Thurston, Robert N., 4,601,543, Cl. 350-334.000.

Meyers, Edward; Liu, Wen-Chih; and Sykes, Richard B., to E. R. Squibb & Sons, Inc. Antibiotics xylocandin A and xylocandin B. 4,601,904, Cl. 424-118.000.

Michael, Wolfgang: *See*—
Schneider, Franz; Pfeifle, Peter; and Michael, Wolfgang, 4,601,190, Cl. 72-347.000.

Michelson, Ilya, to Koch Engineering Company, Inc. Chevron-type mist eliminator and method. 4,601,731, Cl. 55-1.000.

Micro Processor Systems, Inc.: *See*—
Neely, James F.; and Krass, James E., Jr., 4,602,127, Cl. 179-2.00A.

Microdot Inc.: *See*—
Lyon, Lyman R., 4,601,622, Cl. 411-311.000.

Micromanipulator Microscope Company, Inc., The: *See*—
Pettingell, James T.; and Podvin, T. Charles, 4,601,551, Cl. 350-525.000.

Micron Industries Corp.: *See*—
Howard, Victor A. D.; and Heitmanek, William A., 4,602,235, Cl. 336-192.000.

Middleton, Francisco A.: *See*—
Das, Santanu; Middleton, Francisco A.; and Carter, Nicholas J. R., 4,602,363, Cl. 370-58.000.
Hargrave, Franklin; Middleton, Francisco A.; and Das, Santanu, 4,602,362, Cl. 370-54.000.

Midian Electronics, Inc.: *See*—
Soulliard, Charles; Kelly, Kevin; and Lehman, Philip, 4,602,131, Cl. 179-84.0VF.

Midwest Research Institute: *See*—
Mathiprakasam, Balakrishnan, 4,601,587, Cl. 374-25.000.

Migliore, Neil. Assembly system for installing marble panels. 4,601,147, Cl. 52-275.000.

Mikiya, Toshio. Electrically-operated multi-needle chisel tool. 4,601,350, Cl. 173-117.000.

Mikroyannidis, John A.; and Kourtides, Demetrius A., to United States of America, General Counsel-Code GP. Fire resistant polyamide based on 1-[(diorganooxyphosphonyl)methyl]-2,4- and -2,6- diamino benzene. 4,602,081, Cl. 528-337.000.

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Willms, Lothar; Mildenberger, Hilmar; Baur, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,601,747, Cl. 71-92.000.

Miles Laboratories, Inc.: *See*—
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Miller, Alistair A.: *See*—
Sawyer, David A.; Baxter, Martin G.; and Miller, Alistair A., 4,602,017, Cl. 514-242.000.

Miller, Brian M.; and Kogler, Charles R., to Hewlett Packard Company. Apparatus for frequency correction in a frequency synthesizer. 4,602,225, Cl. 332-19.000.

Miller, Darwin A.: *See*—
Miller, Ronnie F.; Dwyer, Arthur L.; Miller, Darwin A.; and Miller, Darwin L., 4,601,194, Cl. 73-40.700.

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Miller, Ronnie F.; Dwyer, Arthur L.; Miller, Darwin A.; and Miller, Darwin L., to Damco Testers, Inc. Method and apparatus for leak testing of pipe. 4,601,194, Cl. 73-40.700.

Miller, Stephen J., to Chevron Research Company. Hydrofinishing catalyst comprising palladium. 4,601,996, Cl. 502-242.000.

Milligan, Ray K.; and Milligan, Sean H., to Helene Holding Company. Printing apparatus with shifting of head or drum to improve resolution. 4,602,262, Cl. 346-160.000.

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Milliken Research Corporation: *See*—
Keller, Margaret S.; and Kluger, Edward W., 4,601,725, Cl. 8-403.000.

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Minagawa, Shoichi: *See*—
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Miner Enterprises, Inc.: *See*—
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Minigrip Inc.: *See*—
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Minnesota Mining and Manufacturing Company: *See*—
Danby, Hal C.; and Beigler, Myron A., 4,601,294, Cl. 128-642.000.
Du Be , D. Robert; and May, Lawrence A., 4,601,661, Cl. 433-134.000.
Musser, Arlene K.; and Koelsch, Peter M., 4,601,532, Cl. 350-1.100.

Minolta Camera Kabushiki Kaisha: *See*—
Yuasa, Yoshio; and Kawagoe, Nobukazu, 4,601,571, Cl. 355-38.000.

Minovitch, Michael A. Tubular conveyor system and operating method. 4,601,389, Cl. 198-804.000.

Mischke, Deborah: *See*—
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Mitchell, Terry: *See*—
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Mitchell, Tyrone D., to General Electric Company. Process for preparing amidosilanes and amidosiloxanes. 4,602,094, Cl. 548-406.000.

Mitral Medical International, Inc.: *See*—
Totten, Robert P., 4,601,719, Cl. 623-2.000.

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Nitta, Issei; Maruyama, Akira; Nakao, Kenichiro; Miyake, Motoyoshi; and Ueno, Hiroaki, 4,602,009, Cl. 514-179.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsubishi Jidoshi Kogyo Kabushiki Kaisha: *See*—
Kozuka, Hajime; and Yoshida, Hiroshi, 4,601,358, Cl. 180-141.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
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Tsuda, Tetsuaki; Asano, Kazuo; Shibuya, Atsuyoshi; Nishihara, Minoru; Yanagi, Kenichi; Kato, Mitsuo; Yamada, Katsuhiko; and Fujisaka, Teijiro, 4,601,794, Cl. 204-15.000.

Mitsuo, Hirofumi; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Process for the preparation of color developer sheets for pressure-sensitive recording. 4,601,920, Cl. 427-150.000.

Miura, Kaoru: *See*—
Kida, Yasuji; Miura, Kaoru; and Kawaguchi, Ikumi, 4,602,075, Cl. 526-293.000.

Miwa, Kiyoshi: *See*—
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Miyachi, Akio: *See*—
Fujimoto, Terunori; Nakagawa, Yasuhiko; Baba, Toshio; Moriyama, Hirokazu; Miyachi, Akio; and Inui, Tsuneo, 4,601,957, Cl. 428-622.000.

Miyakawa, Tatsuo: *See*—
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Miyake, Makoto: *See*—
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Miyake, Motoyoshi: *See*—
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Miyashita, Hitoshi: *See*—
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Miyawaki, Makoto; Hirohata, Michio; Ogawa, Yukio; and Kodaira, Takanori, to Canon Kabushiki Kaisha. Motor driven focal length changing device for a camera. 4,601,563, Cl. 354-195.100.

Miyazaki, Matsuo: *See*—
Nakamura, Yoshiro; Mori, Kunio; Okumura, Minoru; Mochida, Yoshio; and Miyazaki, Matsuo, 4,601,933, Cl. 428-36.000.

Miyazaki, Takeshi; and Sugiyama, Kenji, to Toyoda Gosei Co., Ltd. Hose midway holder. 4,601,448, Cl. 248-56.000.

Miyoshi, Akihiko; Furutani, Shigeki; Chikuma, Isamu; and Shimada, Satoru, to Mazada Motor Corp.; and Nippon Seiko Kaisha. Four-wheel steering system for vehicle. 4,601,357, Cl. 180-140.000.

Mizutani, Yutaka; Harata, Tatsuo; and Tanahashi, Naokatsu, to Nippon Contact Lens Manufacturing Ltd. Contact lens material. 4,602,074, Cl. 526-245.000.

Moatti, Georges: *See*—
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Chu, Pochen; and Yen, Jeffrey H., 4,601,993, Cl. 502-66.000.
Jennings, Alfred R., Jr., 4,601,339, Cl. 166-281.000.
Jensen, Jay E., 4,601,303, Cl. 137-3.000.
Oleck, Stephen M.; Le, Quang N.; and Neuman, Daniel J., 4,601,998, Cl. 502-318.000.
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Mochida, Yoshio: *See*—
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Mohrmann, Karl-Heinrich: *See*—
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Moll, Frederic H., to Endotherapeutics Corporation. Trocar assembly. 4,601,710, Cl. 604-165.000.

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Moniot, Jerome L.: *See*—
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Sikorski, James A.; Mischke, Deborah; and Dutra, Gerard A., 4,601,744, Cl. 671-86.000.
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Montagnino, James G.: *See*—
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Montague, Herbert R., to Control Concepts Corporation. Circuit for suppressing transients occurring in either common or transverse modes. 4,602,308, Cl. 361-91.000.

Moore, Eugene R.; and deFreitas, Maxmilian J., to Dow Chemical Company, The. Grafted rubber concentrates for use in impact resistant polymers. 4,602,064, Cl. 525-316.000.

Moore, Joseph E., to Chevron Research Company. 1-substituted-3-polyhaloalkylthio hydantoin fungicides. 4,602,029, Cl. 514-390.000.

Moore, Kenneth L.: *See*—
Reed, Russell, Jr.; Chan, May L.; and Moore, Kenneth L., 4,601,344, Cl. 169-47.000.

Moosberg, Borje S., to ABU Aktiebolag. Magnetic brake for a fishing reel. 4,601,439, Cl. 242-84.52B.

Mordau, Manfred: *See*—
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More, Henry S.; and Koch, Christopher E., to Exploration Logging, Inc. Method for making logging sleeve. 4,601,100, Cl. 29-885.000.

Moretti, Luciano: *See*—
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Mori, Shigeki; Itoi, Akihiro; and Ichiba, Yoshiyuki, to Murata Kikai Kabushiki Kaisha. Package transporting apparatus. 4,601,434, Cl. 242-35.50A.

Morimoto, Masato: *See*—
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Morinaga Milk Industry Co., Ltd.: *See*—
Okonogi, Shigeo; Ono, Jyoji; Kudo, Tsutomu; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,601,985, Cl. 435-253.000.

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Moriyama, Naomune; and Ohtani, Fumiyuki, to Mazda Motor Corporation. Retractable head-light device for automobiles. 4,602,319, Cl. 362-65.000.

Moriyama, Yoshiaki; Gotoh, Toshio; and Hayashi, Hideki, to Pioneer Electronic Corporation. Recording and reproducing method for video format signal. 4,602,295, Cl. 358-343.000.

Moroboshi, Yasuo; and Nishiwaki, Akira, to Konishiroku Photo Industry Co., Ltd. Method of forming a layer of thin film on a substrate having a multiplicity of mesh-like holes. 4,601,922, Cl. 427-248.100.

Morokawa, Shigeru: *See*—
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Morris, Norman, to Leslie Hartridge Limited. Rotary anti-backlash component. 4,601,601, Cl. 403-359.000.

Morrison, Herbert M.: *See*—
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Morrow, James G., Sr.: *See*—
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Morton, William J., Jr., to Royal Appliance Mfg. Co. Vacuum bag attachment device. 4,601,735, Cl. 55-377.000.

Mos, Gerardus H. M.: *See*—
Rappoldt, Menso P.; and Mos, Gerardus H. M., 4,601,855, Cl. 260-239.55C.

Moser, Hans, to Ciba-Geigy Corporation. Composition for the protection of cultivated plants against the phtotoxic action of herbicides. 4,601,745, Cl. 71-88.000.

Moss, Gaylord E., to United States of America, Navy. Laser eye protection visor using multiple holograms. 4,601,533, Cl. 350-3.700.

Moss, Stephen F.: *See*—
Newsome, Peter M.; Beeley, Lee J.; and Moss, Stephen F., 4,602,041, Cl. 514-634.000.

Mothersole, David S.: *See*—
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Ecklund, Lawrence M., 4,602,379, Cl. 381-12.000.
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Robb, Francine Y., 4,601,778, Cl. 156-628.000.
Vilmur, Richard J.; and D'Avello, Robert F., 4,602,218, Cl. 330-279.000.
Yester, Francis R., Jr.; and Gannon, Mark A., 4,602,229, Cl. 333-208.000.

Mott, Ludwig: *See*—
Waniczek, Helmut; Hohmann, Gerhard; Bartl, Herbert; and Mott, Ludwig, 4,602,056, Cl. 524-272.000.

Mouhot, Frederic: *See*—
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Moulding, Thomas S., Jr. Method of and instrument for injecting a fluid into a uterine cavity and for dispersing the fluid into the fallopian tubes. 4,601,698, Cl. 604-55.000.

Mountain, John F., to Total Solar Energy Systems, Inc. Automatic solar collector system. 4,601,282, Cl. 126-440.000.

Mousel, Canellen K. Legs exercising physical therapy device. 4,601,464, Cl. 272-73.000.

Muccillo, Vincent J., Jr. Suspended platform scale structure. 4,601,356, Cl. 177-211.000.

Mueller, Hans-Rudolf: *See—*
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Mueller, Richard L., Jr., to Argon Medical Corp. Multi-purpose multilumen catheter. 4,601,701, Cl. 604-83.000.
Mugnai, Giorgio, to W. R. Grace & Co., Cryovac Div. Form-fill-seal machine and method with capability for providing a vacuum or inert gas atmosphere within the package. 4,601,159, Cl. 53-511.000.
Muller, Klaus: *See—*
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Multivac Sepp Haggenmuller KG: *See—*
Natterer, Johann; and Ruzic, Ivo, 4,601,421, Cl. 226-173.000.
Mundschenk, Glenn R.; and Decker, Robert C., to General Electric Company. Universal connector for rechargeable and non-rechargeable batteries. 4,602,202, Cl. 320-2.000.
Murahashi, Yoshio, to Asia Suigen Co., Ltd. Well device. 4,601,335, Cl. 166-242.000.
Murakami, Fumitune; and Saito, Katsumi, to Casio Computer Co., Ltd. Electronic calculator capable of checking data in a memory upon operation of a clear key. 4,602,369, Cl. 371-25.000.
Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Sound recording apparatus for electronic still camera. 4,602,296, Cl. 360-10.100.
Murata Kikai Kabushiki Kaisha: *See—*
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Murata Manufacturing Co., Ltd.: *See—*
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Murray, Lawrence K.: *See—*
Hart, C. Jack; Murray, Lawrence K.; Rogers, David L.; and Divis, Richard T., 4,601,892, Cl. 423-456.000.
Musser, Arlene K.; and Koelsch, Peter M., to Minnesota Mining and Manufacturing Company. Narrow band light absorbing filter. 4,601,532, Cl. 350-1.100.
Musso, Pietro, to Ing. C. Olivetti & C., S.p.A. Typing and erasing device for printing machines. 4,601,596, Cl. 400-697.100.
MWL Tool and Supply Company: *See—*
Lindsey, Hiram E., Jr.; Allwin, Roger P.; and Yokley, John M., 4,601,343, Cl. 166-382.000.
Myers, Carl J., to Warner & Swasey Company, The. Turning machine with an automatic tool changer. 4,601,094, Cl. 29-568.000.
Myers, John D. Laser device and method. 4,601,288, Cl. 128-303.100.
Nabeta, Takeshi; and Hanahara, Isamu, to Denki Kagaku Kogyo Kabushiki Kaisha. Resin composition having electromagnetic wave shielding effort. 4,602,051, Cl. 523-137.000.
Nagai, Masaaki, to Fuji Jukogyo Kabushiki Kaisha. Ignition timing control system for an automotive engine. 4,601,272, Cl. 123-425.000.
Nagakura, Koichi: *See—*
Yamamoto, Shinji; Kaijiri, Kohei; and Nagakura, Koichi, 4,602,063, Cl. 525-127.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,601,682, Cl. 474-80.000.
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Automatic means for controlling dosage of illuminating light for picking-up image by endoscope assembly. 4,602,281, Cl. 358-98.000.
Nagata, Masanori: *See—*
Tateisi, Kazuma; Nagata, Masanori; and Hirayama, Mamoru, 4,602,149, Cl. 235-379.000.
Nagatomi, Kazuyuki; and Sato, Rikio, to NEC Corporation. Key telephone system. 4,602,132, Cl. 179-99.00R.
Nagel, Fritz J.: *See—*
West, Michael H.; and Nagel, Fritz J., 4,602,011, Cl. 514-187.000.
Nagoshi, Kazunori, to Tadaaki Sakai. Method of freezing fishery products. 4,601,909, Cl. 426-524.000.
Naito, Tsutomu: *See—*
Izumi, Takayuki; Naito, Tsutomu; Shinya, Masuo; and Nomura, Tomio, 4,601,813, Cl. 208-22.000.
Naito, Yoshiyuki; and Takahashi, Michiharu. Device for preventing electromagnetic wave leakage for use in microwave heating apparatus. 4,602,141, Cl. 219-10.55D.
Nakada, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Structure for mounting loudspeaker on electronic musical instrument. 4,601,361, Cl. 181-141.000.
Nakagawa, Yasuhiko: *See—*
Fujimoto, Terunori; Nakagawa, Yasuhiko; Baba, Toshio; Moriyama, Hirokazu; Miyachi, Akio; and Inui, Tsuneo, 4,601,957, Cl. 428-622.000.
Nakai, Makoto: *See—*
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Nakamori, Shigeru; Ishida, Masaaki; Takagi, Hiroshi; Miwa, Kiyoshi; Ito, Koichi; and Sano, Konosuke, to Ajinomoto Co., Inc. Coryneform bacteria carrying recombinant plasmids and their use in the fermentative production of L-threonine and L-isoleucine. 4,601,983, Cl. 435-115.000.
Nakamura, Michiharu: *See—*
Kawano, Toshihiro; Ohtoshi, Tsukuru; Chinone, Naoki; Kajimura, Takashi; and Nakamura, Michiharu, 4,602,371, Cl. 372-45.000.
Nakamura, Tetsuo: *See—*
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Nakamura, Yasuhisa; and Saito, Yoichi, to Nippon Telegraph & Telephone Public Corporation. Multi-level decision circuit. 4,602,374, Cl. 375-17.000.
Nakamura, Yoshiharu; and Nishimiya, Ryuji, to Nissan Motor Company, Limited. Roof structure with reinforcement therefor for automotive vehicle. 4,601,511, Cl. 296-210.000.
Nakamura, Yoshiro; Mori, Kunio; Okumura, Minoru; Mochida, Yoshio; and Miyazaki, Matsuo, to Nakamura, Yoshiro; Mori, Kunio; and Kabushiki Kaisha Toshiba. Heat transfer promoters and method of using the same. 4,601,933, Cl. 428-36.000.
Nakanishi, Kazuo: *See—*
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Nakanishi, Mutsuo: *See—*
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Nakao, Kenichiro: *See—*
Nitta, Issei; Maruyama, Akira; Nakao, Kenichiro; Miyake, Motoyoshi; and Ueno, Hiroaki, 4,602,009, Cl. 514-179.000.
Nakata, Yukio; and Suda, Kaoru, to Hitachi, Ltd.; and Yagi Antenna Co., Ltd. Method and device for data communication. 4,602,252, Cl. 340-825.500.
Nakayama, Hiromichi, to Nifco Inc. Ball joint. 4,601,603, Cl. 403-143.000.
Nakousai, Tadayuki: *See—*
Chiba, Masahiro; Iwata, Kazuo; Nakousai, Tadayuki; Ogawa, Hiroko; and Ohba, Takashi, 4,601,756, Cl. 106-22.000.
Namnath, James S., to Lever Brothers Company. Bleaching compositions containing mixed metal cations adsorbed onto aluminosilicate support materials. 4,601,845, Cl. 252-99.000.
Nan Chang, Kern K., to RCA Corporation. Insulating mount for a CRT Einzel lens focus mask. 4,602,186, Cl. 313-407.000.
Napadow, Stanley C., to Protectaire Systems Co. Pump-less paint spray booth. 4,601,236, Cl. 98-115.200.
Nasca, Gayle L. Artificial eye. 4,601,673, Cl. 446-389.000.
National Distillers and Chemical Corp.: *See—*
Zehler, Eugene R.; and Flake, Clark J., 4,601,840, Cl. 252-56.00S.
National Forge Company: *See—*
Khare, Ashok K., 4,601,322, Cl. 164-286.000.
National Research Development Corporation: *See—*
Blackley, William S.; Jack, Mervyn A.; and Jordan, James R., 4,602,349, Cl. 364-728.000.
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,602,214, Cl. 324-309.000.
National Semiconductor Corporation: *See—*
Single, Peter S., 4,602,168, Cl. 307-355.000.
National Starch and Chemical Corporation: *See—*
Skoultchi, Martin M.; and Battaglia, Alfred G., 4,602,073, Cl. 526-208.000.
Natterer, Johann; and Ruzic, Ivo, to Multivac Sepp Haggenmuller KG. Feeding means for feeding a material web in a packaging machine. 4,601,421, Cl. 226-173.000.
Naturin-Werk Becker & Company: *See—*
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NCR Corporation: *See—*
Craycraft, Donald G.; and Pham, Giao N., 4,602,354, Cl. 365-203.000.
Near Equilibrium Research Associates: *See—*
Oliker, Michael D., 4,601,732, Cl. 55-20.000.
NEC Corporation: *See—*
Nagatomi, Kazuyuki; and Sato, Rikio, 4,602,132, Cl. 179-99.00R.
Oda, Eiji, 4,601,098, Cl. 29-578.000.
Ohtake, Akihito, 4,602,329, Cl. 364-200.000.
Takumi, Kenta, 4,602,366, Cl. 370-94.000.
Watanabe, Hiroshi, 4,602,355, Cl. 365-206.000.
Yamada, Kazumori; and Akahori, Masaaki, 4,602,254, Cl. 340-825.480.
Yukawa, Akira, 4,602,167, Cl. 307-355.000.
NEC Home Electronics, Ltd.: *See—*
Fujiwara, Shinsuke, 4,601,241, Cl. 101-93.040.
Neely, James F.; and Krass, James E., Jr., to Micro Processor Systems, Inc. Diagnostic data recorder. 4,602,127, Cl. 179-2.00A.
Nelson, Alfred M.: *See—*
Roberts, William E.; and Nelson, Alfred M., 4,601,382, Cl. 198-432.000.
Nelson, Erik B., to Dowell Schlumberger Incorporated. Sulfonated poly (vinyl aromatics) as fluid loss additives for salt cement slurries. 4,601,758, Cl. 106-90.000.
Nelson, Ronald J.: *See—*
Besomi, Paul R.; Nelson, Ronald J.; and Wilson, Randall B., 4,601,888, Cl. 422-253.000.
Nemeth, Alan G.: *See—*
Bahr, Richard G.; Kinney, Daryl F.; Nemeth, Alan G.; and Raizen, Helen S., 4,601,586, Cl. 370-94.000.
Nesbit, Larry A.: *See—*
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Nestec S. A.: *See—*
Luddy, Francis E.; and Longhi, Sergio, 4,601,857, Cl. 260-428.500.
Nestork, William J.: *See—*
Dougherty, William E., Jr.; Greer, Stuart E.; Nestork, William J.; and Norris, William T., 4,602,271, Cl. 357-80.000.

Neufeldt, Allen A.: *See*—
Damp, Stephen P.; Johnson, Harvey G.; and Neufeldt, Allen A., 4,601,605, Cl. 404-95.000.
Neuman, Daniel J.: *See*—
Oleck, Stephen M.; Le, Quang N.; and Neuman, Daniel J., 4,601,998, Cl. 502-318.000.
Neumeier, Paul J., to Access Corporation. Machine-retrievable card and card retrieval apparatus and method therefor. 4,601,397, Cl. 209-608.000.
Neustadt, Alf K.: *See*—
Oehmichen, Eckhart; and Neustadt, Alf K., 4,601,559, Cl. 353-111.000.
Newman, Robert J.: *See*—
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Newport Pharmaceuticals, Inc.: *See*—
Simon, Lionel N.; Mueller, Hans-Rudolf; and Zutter, Hans, 4,602,089, Cl. 544-265.000.
Newsome, Peter M.; Beeley, Lee J.; and Moss, Stephen F., to Beecham Group P.L.C. Benzylideneamino- and phenylacetylguanidines and their pharmaceutical uses. 4,602,041, Cl. 514-634.000.
Newsome, Reginald W.: *See*—
Nichols, Walter A.; and Newsome, Reginald W., 4,601,298, Cl. 131-336.000.
NGK Insulators, Ltd.: *See*—
Oda, Isao; and Matsuhisa, Tadaaki, 4,601,332, Cl. 165-165.000.
NGK Spark Plug Co., Ltd.: *See*—
Ando, Minato; Ito, Masaaki; and Kato, Takashi, 4,601,990, Cl. 501-153.000.
Ando, Minato; and Ito, Masaaki, 4,601,991, Cl. 501-153.000.
Asayama, Yoshiaki; and Kominami, Seiya, 4,601,793, Cl. 204-1.00T.
Sakai, Masao; Sugimoto, Makoto; Hashizume, Miyakazu; Tanaka, Yutaka; and Ito, Yukihiko, 4,601,848, Cl. 252-503.000.
Nichols, David B., Jr., to RCA Corporation. Textile dyeing process and apparatus for multicolor patterns. 4,601,727, Cl. 8-477.000.
Nichols, George M.: *See*—
Carr, Lawrence J.; Nichols, George M.; and Rose, Selwyn H., 4,601,843, Cl. 252-78.500.
Nichols, Walter A.; and Newsome, Reginald W., to Philip Morris Incorporated. Filter cigarette. 4,601,298, Cl. 131-336.000.
Nicholson, Peter. Shutterless pulse laser recording system and method. 4,601,534, Cl. 350-3.830.
Nicholson, Terence P. Hat-shaped shaft seal of multiple layered material. 4,601,475, Cl. 277-205.000.
Nicoloff, Demetre M.: *See*—
Possis, Zinon C.; and Nicoloff, Demetre M., 4,601,718, Cl. 623-1.000.
Niel, Philippe: *See*—
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Nifco Inc.: *See*—
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Niitsuma, Teruo: *See*—
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Nikka Chemical Ind. Co., Ltd.: *See*—
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Nilsson, Ingvar: *See*—
Rausing, Hans; and Nilsson, Ingvar, 4,601,692, Cl. 493-355.000.
Nilsson, Sven B.: *See*—
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Nimco Corporation: *See*—
Bachner, Larry G., 4,601,425, Cl. 229-17.00G.
Ninomiya, Yoshito: *See*—
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Nippon Contact Lens Manufacturing Ltd.: *See*—
Mizutani, Yutaka; Harata, Tatsuo; and Tanahashi, Naokatsu, 4,602,074, Cl. 526-245.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iijima, Kenzaburo; Hoshi, Toshiharu; Asano, Kazumoto; and Hayashi, Yoshinori, 4,601,764, Cl. 148-101.000.
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Nippon Kogaku K. K.: *See*—
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Nippon Kokan Kabushiki Kaisha: *See*—
Fukuda, Shuzo; Ohkubo, Yutaka; Ishii, Toshio; Sagiyama, Masaru; and Tonouchi, Akira, 4,601,801, Cl. 204-206.000.
Yamada, Kenzo; Iwasaki, Katsuhiro; Ohtsuki, Mitsuru; and Ito, Haruo, 4,601,749, Cl. 75-53.000.
Nippon Motorola Ltd.: *See*—
Arimoto, Sohei; and Miyashita, Hitoshi, 4,602,224, Cl. 332-16.00T.
Nippon Oil and Fats Company, Limited: *See*—
Suzuki, Masao; Hashimoto, Kenichi; and Satoh, Tadashi, 4,601,856, Cl. 260-419.000.
Ueda, Takeo; and Ohsumi, Yoshiro, 4,601,243, Cl. 102-200.000.
Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,601,647, Cl. 418-259.000.
Nippon Seiko Kaisha: *See*—
Miyoshi, Akihiko; Furutani, Shigeki; Chikuma, Isamu; and Shimada, Satoru, 4,601,357, Cl. 180-140.000.
Nippon Soken, Inc.: *See*—
Kago, Yoshiyuki; and Akita, Shigeyuki, 4,602,256, Cl. 340-825.720.
Kitagawa, Junji; Akita, Shigeyuki; and Yamanoue, Kouichi, 4,602,255, Cl. 340-825.690.
Nippon Telegraph & Telephone Public Corporation: *See*—
Nakamura, Yasuhisa; and Saito, Yoichi, 4,602,374, Cl. 375-17.000.
Ogawa, Katsuhiko; and Horiguchi, Shinju, 4,602,383, Cl. 382-56.000.
Nippondenso Co., Ltd.: *See*—
Kato, Masaaki; Tojo, Shigeki; and Arai, Kazuyoshi, 4,601,269, Cl. 123-300.000.
Kuroyanagi, Masatoshi; Suzuki, Masahiko; and Iwata, Hiroshi, 4,601,641, Cl. 417-220.000.
Matsuhashi, Hajime; Maruyama, Toshinori; and Torii, Koshi, 4,602,205, Cl. 320-64.000.
Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, to Sanofi. Substituted trifluoromethylphenyltetrahydropyridines having a cyano substituent and an anorectic activity, a process for preparing same and pharmaceutical compositions. 4,602,024, Cl. 514-357.000.
Nishida, Masami: *See*—
Oka, Masahiko; and Nishida, Masami, 4,601,627, Cl. 414-225.000.
Nishide, Toshiaki: *See*—
Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, 4,601,911, Cl. 427-34.000.
Nishihara, Minoru: *See*—
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Nishikawa, Makoto; and Tanaka, Minoru, to Kumahira Safe Co. Inc. Locking and unlocking device. 4,602,150, Cl. 235-382.000.
Nishikawa, Mitsuru, to Sumitomo Electric Industries, Ltd. Microlens. 4,601,548, Cl. 350-416.000.
Nishimatsu, Masaharu: *See*—
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Nishimiya, Ryuji: *See*—
Nakamura, Yoshiharu; and Nishimiya, Ryuji, 4,601,511, Cl. 296-210.000.
Nishimura, Shinichi: *See*—
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Nishioka, Goro: *See*—
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Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, 4,601,989, Cl. 501-136.000.
Nishitani, Yasuo; and Yano, Osahiko, to Matsushita Electric Industrial Co., Ltd. Video tape recorder having uninterrupted tracking control during insert edit mode. 4,602,298, Cl. 360-14.100.
Nishiwaki, Akira: *See*—
Moroboshi, Yasuo; and Nishiwaki, Akira, 4,601,922, Cl. 427-248.100.
Nishiyama, Toyoo, to Olympus Optical Co., Ltd. Method for manufacturing a magnetic head. 4,601,099, Cl. 29-603.000.
Nissan Motor Co., Ltd.: *See*—
Hirano, Yoshinori, 4,601,264, Cl. 123-41.270.
Iwanaga, Kazuyoshi, 4,601,219, Cl. 74-867.000.
Kitahara, Tsuyoshi; and Sone, Kohki, 4,601,273, Cl. 123-440.000.
Kitahara, Tsuyoshi, 4,601,809, Cl. 204-406.000.
Nakamura, Yoshiharu; and Nishimiya, Ryuji, 4,601,511, Cl. 296-210.000.
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,602,247, Cl. 340-575.000.
Sugano, Kazuhiko, 4,601,233, Cl. 92-52.000.
Tanino, Mikio; Tada, Eiji; and Takano, Tsutomu, 4,601,177, Cl. 62-149.000.
Nitta, Issei; Maruyama, Akira; Nakao, Kenichiro; Miyake, Motoyoshi; and Ueno, Hiroaki, to Mitsubishi Chemical Industries, Ltd. Corticoid derivatives and process for production thereof. 4,602,009, Cl. 514-179.000.
Nitta, Tsuneharu: *See*—
Nomura, Koji; Ogawa, Hisahito; Abe, Atsushi; and Nitta, Tsuneharu, 4,602,192, Cl. 315-169.300.
Noda, Yasushi, to Teac Corporation. Recorder/reproducer apparatus with a disc-shaped record medium. 4,602,306, Cl. 360-99.000.
Noguchi, Haruo, to Colortronic Co., Ltd. Method and apparatus for demoisturizing and heating drying air for drying synthetic plastic material. 4,601,114, Cl. 34-27.000.
Noguchi, Rika: *See*—
Yasuda, Goichi; Noguchi, Rika; and Tanaka, Yoichi, 4,601,841, Cl. 252-62.900.
Nomura, Hirokazu: *See*—
Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, 4,601,911, Cl. 427-34.000.
Nomura, Koji; Ogawa, Hisahito; Abe, Atsushi; and Nitta, Tsuneharu, to Matsushita Electric Industrial Co., Ltd. Thin film integrated device. 4,602,192, Cl. 315-169.300.
Nomura, Tomio: *See*—
Izumi, Takayuki; Naito, Tsutomu; Shinya, Masuo; and Nomura, Tomio, 4,601,813, Cl. 208-22.000.
Noponen, Asko K.; and Pyysalo, Tapani, to Orion-yhtyma Oy Fermion. Mouthwash composition and a method for preparing it. 4,601,900, Cl. 424-54.000.
Nordica S.p.A.: *See*—
Leonardi, Alfio, 4,601,117, Cl. 36-120.000.

Nordisk Insulinlaboratorium: *See—*
Andresen, Finn H.; Balschmidt, Per; Hejnos, Kim R.; and Kofod, Hans, 4,601,979, Cl. 435-70.000.
Nordskog, Robert A. Compact gas compressor check valve. 4,601,305, Cl. 137-528.000.
Nordson Corporation: *See—*
Schmitkons, James W., 4,601,645, Cl. 418-9.000.
Trevathan, Larry C.; and Farmer, Jerry R., 4,601,427, Cl. 239-11.000.
Norris, William T.: *See—*
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North American Philips Consumer Electronics Corp.: *See—*
Fischman, Martin; and Gallaro, Anthony V., 4,602,187, Cl. 313-479.000.
North Carolina State University: *See—*
Beasley, Eustace O., 4,601,248, Cl. 111-52.000.
Northern States Power Company: *See—*
Skinner, Michael F., 4,601,430, Cl. 241-101.200.
Northern Telecom Limited: *See—*
McKay, Glen; Smith, Henry F.; Price, Ronald W.; and Keshavjee, Firoz A., 4,601,208, Cl. 73-829.000.
Mercier, Jacques S.; and Ho, Vu Q., 4,601,781, Cl. 156-643.000.
Norton Company: *See—*
Dolan, Michael J., 4,601,739, Cl. 62-20.000.
Nowacki, Christopher: *See—*
Brisson, Alfred G.; and Nowacki, Christopher, 4,602,171, Cl. 307-491.000.
Nozaki, Shigeki; Takemae, Yoshihiro; and Enomoto, Seiji, to Fujitsu Limited. Semiconductor memory device. 4,602,356, Cl. 365-230.000.
Nugent, Mark. Pharmaceutical capsule compositions and structures for gastric sensitive materials. 4,601,896, Cl. 424-36.000.
Nukala, August R.; Perez, Arthur; and Brumfield, Timothy L., to RPR Filtration Systems, Inc. Fluid vacuum distillation system. 4,601,381, Cl. 196-114.000.
Numata, Saburo, to Fuji Photo Optical Co., Ltd. Exciting circuit for electronic flash device. 4,602,194, Cl. 315-241.00P.
Nunley, Charles L.; and Tomaselli, Joe W., to Loadmaster Systems, Inc. Welded roof support. 4,601,151, Cl. 52-410.000.
Nyby Uddeholm Powder AB: *See—*
Aslund, Christer; and Andersson, Torbjorn, 4,601,878, Cl. 419-49.000.
O. F. Mossberg & Sons, Inc.: *See—*
Swearengen, Thomas F.; and Makauskas, Walter J., 4,601,123, Cl. 42-72.000.
O&K Orenstein: *See—*
Heine, Franz; and Kowalewski, Manfred, 4,601,626, Cl. 414-687.000.
Obara, Hideo: *See—*
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,602,247, Cl. 340-575.000.
Oberhardt, Bruce J.: *See—*
Mammolenti, Joseph; and Oberhardt, Bruce J., 4,601,697, Cl. 604-43.000.
Oberlin, Dirk: *See—*
Weber, Kenneth E.; and Oberlin, Dirk, 4,602,052, Cl. 523-215.000.
Obermeier, Rainer; Ludwig, Jurgen; and Seipke, Gerhard, to Hoechst Aktiengesellschaft. Process for the preparation of human or the derivatives thereof from pig insulin or the derivatives thereof. 4,601,852, Cl. 530-303.000.
O'Brien, Stephen M.: *See—*
Lau, Hon C.; and O'Brien, Stephen M., 4,601,337, Cl. 166-263.000.
O'Brien, William D., Jr.: *See—*
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Octor, Henri: *See—*
Marty, Michel; Octor, Henri; and Walder, Andre , 4,601,874, Cl. 419-23.000.
Oda, Eiji, to NEC Corporation. Method of manufacturing plural active regions followed by a chain step formation. 4,601,098, Cl. 29-578.000.
Oda, Isao; and Matsuhisa, Tadaaki, to NGK Insulators, Ltd. Ceramic recuperative heat exchangers and a method for producing the same. 4,601,332, Cl. 165-165.000.
O'Donnell, Ciaran: *See—*
Finger, Ulrich; Ligneres, Pierre; and O'Donnell, Ciaran, 4,602,328, Cl. 364-200.000.
Oehmichen, Eckhart; and Neustadt, Alf K. Slide projector and slide tray. 4,601,559, Cl. 353-111.000.
Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See—*
Marty, Michel; Octor, Henri; and Walder, Andre , 4,601,874, Cl. 419-23.000.
O'Flanagan, Michael. Sighting device for a golf putter. 4,601,472, Cl. 273-186.00A.
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Adapter for a miniature type tape cassette. 4,602,300, Cl. 360-60.000.
Ogawa, Hiroko: *See—*
Chiba, Masahiro; Iwata, Kazuo; Nakousai, Tadayuki; Ogawa, Hiroko; and Ohba, Takashi, 4,601,756, Cl. 106-22.000.
Ogawa, Hisahito: *See—*
Nomura, Koji; Ogawa, Hisahito; Abe, Atsushi; and Nitta, Tsuneharu, 4,602,192, Cl. 315-169.300.
Ogawa, Katsuhiko; and Horiguchi, Shinju, to Nippon Telegraph & Telephone Public Corporation. Image data compression system. 4,602,383, Cl. 382-56.000.
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Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,602,300, Cl. 360-60.000.
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Miyawaki, Makoto; Hirohata, Michio; Ogawa, Yukio; and Kodaira, Takanori, 4,601,563, Cl. 354-195.100.
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Ohio State University Research Foundation: *See—*
Saccocio, Sean M., 4,601,537, Cl. 350-96.270.
Ohkubo, Yutaka: *See—*
Fukuda, Shuzo; Ohkubo, Yutaka; Ishii, Toshio; Sagiyama, Masaru; and Tonouchi, Akira, 4,601,801, Cl. 204-206.000.
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Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,601,964, Cl. 430-84.000.
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Ide, Yukio; and Ohseto, Seiichi, 4,601,965, Cl. 430-85.000.
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Ueda, Takeo; and Ohsumi, Yoshiro, 4,601,243, Cl. 102-200.000.
Ohta, Takahiro, to Fuji Photo Film Co., Ltd. Color optical printer head having liquid crystal layer. 4,601,546, Cl. 350-339.00F.
Ohtake, Akihito, to NEC Corporation. Data processing system having an address translation unit shared by a CPU and a channel unit. 4,602,329, Cl. 364-200.000.
Ohtani, Fumiyuki: *See—*
Moriyama, Naomune; and Ohtani, Fumiyuki, 4,602,319, Cl. 362-65.000.
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Kawano, Toshihiro; Ohtoshi, Tsukuru; Chinone, Naoki; Kajimura, Takashi; and Nakamura, Michiharu, 4,602,371, Cl. 372-45.000.
Ohtsuki, Mitsuru: *See—*
Yamada, Kenzo; Iwasaki, Katsuhiro; Ohtsuki, Mitsuru; and Ito, Haruo, 4,601,749, Cl. 75-53.000.
Ohzono, Kouhei: *See—*
Hayashi, Tsutomu; and Ohzono, Kouhei, 4,601,375, Cl. 192-85.0AA.
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Oka, Masahiko; and Nishida, Masami, to Dainippon Screen Manufacturing Co., Ltd. Apparatus for transferring thin sheet-like article such as wafers. 4,601,627, Cl. 414-225.000.
Okamoto, Takeshi; Minagawa, Shoichi; and Niitsuma, Teruo, to Clarion Co., Ltd. Surface acoustic wave device with a 3-phase unidirectional transducer. 4,602,183, Cl. 310-313.00B.
O'Keefe, William F.; and Garcia, Sonny Q., to O'Keefe's, Inc. Fire rated wall/door system. 4,601,143, Cl. 52-171.000.
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O'Keefe, William F.; and Garcia, Sonny Q., 4,601,143, Cl. 52-171.000.
Okonogi, Shigeo; Ono, Jyoji; Kudo, Tsutomu; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, to Morinaga Milk Industry Co., Ltd. Microorganism belonging to *streptococcus thermophilus* and a composition containing said microorganism. 4,601,985, Cl. 435-253.000.
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Nakamura, Yoshiro; Mori, Kunio; Okumura, Minoru; Mochida, Yoshio; and Miyazaki, Matsuo, 4,601,933, Cl. 428-36.000.
Oldfield, Benjamin D.; Owen, Phillip J.; and Hague, Colin, to Renold PLC. Phasing device for machine applications. 4,601,266, Cl. 123-90.150.
Oldham, Philip B.: *See—*
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Oleck, Stephen M.; Le, Quang N.; and Neuman, Daniel J., to Mobil Oil Corporation. Method and catalyst for removing contaminants from hydrocarbonaceous fluids using a copper-group via metal-alumina catalyst. 4,601,998, Cl. 502-318.000.
Oliker, Michael D., to Near Equilibrium Research Associates. Apparatus for recovering dilute species in a fluid stream. 4,601,732, Cl. 55-20.000.
Olin Corporation: *See—*
Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., 4,601,460, Cl. 266-216.000.
Youngstrand, Richard H., 4,601,767, Cl. 149-109.600.
Olinger, Barton W.: *See—*
Schiferl, David; Olinger, Barton W.; and Livingston, Robert W., 4,602,377, Cl. 378-150.000.
Olofsson, Stig: *See—*
Billing, Lars T.; and Olofsson, Stig, 4,601,408, Cl. 221-168.000.
Olsen, David W.: *See—*
Wittman, Leroy L.; and Olsen, David W., 4,601,401, Cl. 212-180.000.
Olson, Daniel H., to Snyder Laboratories, Inc. Chest drainage device with sound muffling tube. 4,601,715, Cl. 604-321.000.
Olson, Hjalmar A., to General Electric Company. Insulated armature coil for dynamoelectric machine. 4,602,180, Cl. 310-215.000.

Olympus Optical Co., Ltd.: *See—*
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,602,281, Cl. 358-98.000.
Nishiyama, Toyoo, 4,601,099, Cl. 29-603.000.
Sato, Masaaki, 4,602,358, Cl. 369-12.000.

Omron Tateisi Electronics Co.: *See—*
Tateisi, Kazuma; Nagata, Masanori; and Hirayama, Mamoru, 4,602,149, Cl. 235-379.000.

O'Neill, John F., to GTE Lenkurt Incorporated. Adaptive echo cancelling system and method utilizing linear code spacing. 4,602,133, Cl. 179-170.200.

Ono, Jyoji: *See—*
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Ono, Tomoyoshi: *See—*
Takahara, Ichiro; Ono, Tomoyoshi; and Nakai, Makoto, 4,601,588, Cl. 374-106.000.

Onodera, Nobutoshi: *See—*
Kurahashi, Kazuo; and Onodera, Nobutoshi, 4,601,955, Cl. 428-614.000.

Onward Hardware Limited: *See—*
Witzel, Ted, 4,601,280, Cl. 126-121.000.

Oota, Yasuto; and Shimizu, Makoto, to Tokyo Tatsuno Co., Ltd. Liquid level and quantity measuring apparatus. 4,601,201, Cl. 73-304.00C.

Opsahl, Allan W., to Boeing Company, The. Aircraft door counterbalance system. 4,601,446, Cl. 244-129.500.

Ordines, Jean-Pierre; Bacot, Dominique; and Detroyat, Jean-Michel, to Bacot, Dominique; and Detroyat, Jean-Michel. High voltage generator for an electrostatic dust precipitator. 4,601,733, Cl. 55-139.000.

ORIGA GmbH Pneumatik: *See—*
Hoinkis, Rainer E., 4,601,234, Cl. 92-88.000.

Orion-yhtyma Oy Fermion: *See—*
Noponen, Asko K.; and Pyysalo, Tapani, 4,601,900, Cl. 424-54.000.

Ortho Pharmaceutical Corporation: *See—*
Jiang, Jack B., 4,602,013, Cl. 514-214.000.

Ortolf, James M.: *See—*
White, William J.; Ortolf, James M.; and Gordon, William R., 4,601,526, Cl. 339-17.0CF.

Orvos, Peter S.: *See—*
Jatczak, Chester F.; Lee, Peter W.; and Orvos, Peter S., 4,601,592, Cl. 384-564.000.

Otsuka, Fumio: *See—*
Hayashi, Mikio; and Otsuka, Fumio, 4,601,594, Cl. 400-196.100.

Oum, Sang O.: *See—*
Gabbay, Moses A.; and Oum, Sang O., 4,602,382, Cl. 381-90.000.

Ovshinsky, Herbert, to Sovonics Solar Systems. Vertical semiconductor processor. 4,601,260, Cl. 118-718.000.

Owen, Phillip J.: *See—*
Oldfield, Benjamin D.; Owen, Phillip J.; and Hague, Colin, 4,601,266, Cl. 123-90.150.

Owens-Corning Fiberglas Corporation: *See—*
Kaveh, Farrokh, 4,601,742, Cl. 65-14.000.
Stotler, David V.; and Coffey, Fred S., 4,601,741, Cl. 65-4.400.

Owens-Illinois, Inc.: *See—*
Jabarin, Saleh A.; and Fehn, Gregory M., 4,601,926, Cl. 428-35.000.
Juvinall, John W.; Lovalenti, Sam; and Rogge, William H., 4,601,395, Cl. 209-526.000.

Owens, Kenneth B.: *See—*
Dilgren, Richard E.; and Owens, Kenneth B., 4,601,336, Cl. 166-252.000.

Oy Wartsila Ab: *See—*
Oinonen, Hannu; and Jaaskelainen, Jyrki, 4,601,441, Cl. 242-56.00R.
Tomma, Kauko; and Malmi, Jarmo, 4,601,435, Cl. 242-56.400.

Ozols, Roland. Counterbalance spring means. 4,601,131, Cl. 49-206.000.

PACE Incorporated: *See—*
Vogel, Alan D., 4,602,144, Cl. 219-230.000.

Pacific Scientific Company: *See—*
Von Bargen, Kenneth P.; and Taschner, Kenneth A., 4,602,243, Cl. 340-347.0AD.

Pajaujis, Frank P.: *See—*
Clark, Sheldon L.; and Pajaujis, Frank P., 4,602,060, Cl. 524-745.000.

Palm, John W.; and Kunkel, Lorenz V., to Amoco Corporation. Cooling and condensing of sulfur and water from Claus process gas. 4,601,330, Cl. 165-95.000.

Palmer, Patrick R.: *See—*
Williams, Barry W.; and Palmer, Patrick R., 4,602,209, Cl. 323-351.000.

Palmer, Richard C., to RCA Corporation. Method for determining variations from flatness in the topography of a disc surface. 4,602,359, Cl. 369-58.000.

Palvadeau, Claude; and Scheidt, Claude, to Societe Miniere et Metallurgique de Penarroya. Apparatus for preparing metal by electrolysis. 4,601,805, Cl. 204-255.000.

Panafacom Limited: *See—*
Ikeya, Fumihiro, 4,602,330, Cl. 364-200.000.

Panicker, Ramachandra M. P., to Sigmatron Nova, Inc. Light sink layer for a thin-film EL display panel. 4,602,189, Cl. 313-505.000.

Papadopoulos, George E. Drive release brake assembly. 4,601,370, Cl. 192-8.00R.

Papantoniou, Christos: *See—*
Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, 4,601,901, Cl. 424-61.000.

Parish, Carl D., to K.M.P. Manufacturing Co., Inc. Automatic reversible wheel track filler. 4,601,347, Cl. 172-134.000.

Parker, Roger A., to Merrell Dow Pharmaceuticals Inc. Antirhinovirus agents. 4,602,099, Cl. 549-479.000.

Parkyn, Kathleen C.: *See—*
Parkyn, William A., Sr., 4,601,312, Cl. 138-97.000.

Parkyn, William A., Sr., to Parkyn, William A., Sr.; and Parkyn, Kathleen C. Repair of holes and cracks in clay sewer pipe. 4,601,312, Cl. 138-97.000.

Parry, Curtis L.; and Cushing, Gary R., to Salinas Valley Engineering & Mfg., Inc. Apparatus for bunching, trimming, and banding vegetables. 4,601,156, Cl. 53-399.000.

Pastva, John V., to Eastern Company, The. Door control mechanism. 4,601,501, Cl. 292-218.000.

Patchett, Arthur A.; and Wu, Mu T., to Merck & Co., Inc. N-carboxymethyl substituted lysyl and α-(ε-aminoalkyl) glycyl amino acid antihypertensive agents. 4,602,002, Cl. 514-11.000.

Patonay, Gabor; Warner, Isiah M.; and Oldham, Philip B., to Emory University. Method and apparatus for the stabilization of direct current arc lamps. 4,602,193, Cl. 315-170.000.

Paul Wurth S.A.: *See—*
Legille, Edouard; Ulveling, Leon; and Mailliet, Pierre, 4,601,617, Cl. 406-129.000.

Pauling, Horst: *See—*
Hanck, Alfred; and Pauling, Horst, 4,602,036, Cl. 514-494.000.

Pavie, Claude, to HBS. Method and device for sorting flat and indexed articles. 4,601,396, Cl. 209-569.000.

Pavlovic, Mica: *See—*
Tomkin, Douglas; and Pavlovic, Mica, 4,602,320, Cl. 362-80.000.

Pavlovsky, Rudolf; and Drazan, Pavel. Apparatus for transmitting force from actuating element of an electromagnet to a component. 4,602,233, Cl. 335-258.000.

Payne, Richard S.: *See—*
Hemmah, Steven M.; and Payne, Richard S., 4,601,760, Cl. 148-1.500.

Pazzi, Fausto. Machine and method for the automatic folding of cloths. 4,601,695, Cl. 493-418.000.

Peace, Edward R. Tank leakage detection system. 4,602,250, Cl. 340-605.000.

Pedain, Josef: *See—*
Wellner, Wolfgang; Pedain, Josef; and Gruber, Hermann, 4,602,071, Cl. 525-528.000.

Pedersen, Kurt F. L.: *See—*
Deneke, Albert; and Pedersen, Kurt F. L., 4,602,136, Cl. 200-50.00A.

Peev, Jivko N.; and Siderov, Penko M., to Zavod "Avtomatika". Machine for vine material engrafting. 4,601,129, Cl. 47-6.000.

Pellhammer, Maurus; and Siewert, Wolfgang, to Escher W GmbH. Sorting apparatus for fiber stock, especially for manufacturing paper. 4,601,819, Cl. 209-273.000.

Pelt & Hooykaas B.V.: *See—*
Hooykaas, Carel W. J., 4,601,832, Cl. 210-717.000.

Peltier, Marcel: *See—*
Melard, Pierre; Peltier, Marcel; and Tastu, Francis, 4,601,755, Cl. 106-3.000.

Pelzl, Gerhard: *See—*
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; Enzenberg, Hartmut; and Isenberg, Andreas, 4,601,846, Cl. 252-299.100.

Penton, Harold R.; and Pettigrew, F. Alexander, to Ethyl Corporation. Aryloxy-alkoxy-allylphenoxy substituted polyphosphazenes. 4,602,048, Cl. 521-82.000.

Pepi, John W.; and Finch, Christopher M., to United States of America, Air Force. Fine figuring actuator. 4,601,553, Cl. 350-611.000.

Peppler, Dennis L.: *See—*
Zaman, Mohammad F.; and Peppler, Dennis L., 4,601,918, Cl. 427-120.000.

Perez, Arthur: *See—*
Nukala, August R.; Perez, Arthur; and Brumfield, Timothy L., 4,601,381, Cl. 196-114.000.

Perkin-Elmer Corporation, The: *See—*
Whistler, Wayne J., 4,601,211, Cl. 73-863.330.

Perkins, William C.; and Whang, Keh-Wen, to General Electric Company. Apparatus for and method of attenuating power line carrier communication signals passing between substation distribution lines and transmission lines through substation transformers. 4,602,240, Cl. 340-310.00R.

Perlmutter, Leonard, to K.C. Southern Railway Company. Fuel efficient control of multiple unit locomotive consists. 4,602,335, Cl. 364-426.000.

Permoda, Ronald L., to Xerox Corporation. Apparatus and method for angularly connecting two plates. 4,601,621, Cl. 411-182.000.

Persson, Bengt A. Flush system. 4,601,071, Cl. 4-333.000.

Persson, Erling: *See—*
Hellsberg, Bert V., 4,602,151, Cl. 235-383.000.

Pertec Peripherals Corporation: *See—*
Fultz, Jack, 4,602,304, Cl. 360-77.000.

Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, to Agfa Gevaert Aktiengesellschaft. Cover for the light channel for a device for switching-off a magnetic cassette tape at the end of its run. 4,602,303, Cl. 360-74.600.

Peterson, Francis C.: *See—*
Ernst, Richard J.; Peterson, Francis C.; and Sledz, Melissa L., 4,601,625, Cl. 411-387.000.

Petri, Robert J.: *See—*
Acampora, Alfonse; and Petri, Robert J., 4,602,274, Cl. 358-11.000.

Pettigrew, F. Alexander: *See*—
Penton, Harold R.; and Pettigrew, F. Alexander, 4,602,048, Cl. 521-82.000.
Pettingell, James T.; and Podvin, T. Charles, to Micromanipulator Microscope Company, Inc., The. Manipulation of embryos and ova. 4,601,551, Cl. 350-525.000.
Petukhov, Mikhail M.: *See*—
Roiz, Lev M.; Petukhov, Mikhail M.; and Kagansky, Arkady I., 4,602,185, Cl. 313-25.000.
Petursson, Drew: *See*—
Breen, Jonathon; and Petursson, Drew, 4,601,302, Cl. 135-66.000.
Pfahl, Kurt: *See*—
Birkes, Stephen; Hill, Donna L.; and Pfahl, Kurt, 4,601,924, Cl. 428-7.000.
Pfeifle, Peter: *See*—
Schneider, Franz; Pfeifle, Peter; and Michael, Wolfgang, 4,601,190, Cl. 72-347.000.
Pfizer Inc.: *See*—
Cardinal, John R., 4,601,893, Cl. 424-15.000.
Cross, Peter E.; and Dickinson, Roger P., 4,602,016, Cl. 514-234.000.
Saxton, Craig A. P. D., 4,601,897, Cl. 424-45.000.
Stong, Randel E.; and Walinsky, Stanley W., 4,602,067, Cl. 525-327.400.
Phalen, Robert F. Membrane switch. 4,602,135, Cl. 200-5.00A.
Pham, Giao N.: *See*—
Craycraft, Donald G.; and Pham, Giao N., 4,602,354, Cl. 365-203.000.
Philip Morris Incorporated: *See*—
Nichols, Walter A.; and Newsome, Reginald W., 4,601,298, Cl. 131-336.000.
Philipp, Clemens: *See*—
Artz, Gerd; Beckmann, Gerhard; Figge, Dieter; and Philipp, Clemens, 4,601,324, Cl. 164-432.000.
Phillips, Brian K.: *See*—
Bell, James L., Jr.; Thatcher, Mark T.; Phillips, Brian K.; Brammer, Norman; and Sweeney, Thomas F., 4,601,491, Cl. 285-24.000.
Phillips, Edwin. Quick turn metering valve. 4,601,310, Cl. 137-556.000.
Phillips Petroleum Company: *See*—
Bresson, Clarence R.; and Kimble, Kenneth B., 4,601,818, Cl. 209-166.000.
Drake, Charles A., 4,602,119, Cl. 585-640.000.
Fodor, Lawrence M.; and Cobb, R. Lynn, 4,601,340, Cl. 166-294.000.
Hart, C. Jack; Murray, Lawrence K.; Rogers, David L.; and Divis, Richard T., 4,601,892, Cl. 423-456.000.
Matson, Michael S.; and Kahle, Gerald R., 4,602,114, Cl. 549-266.000.
Wegner, Eugene H.; and Shay, Lucas K., 4,601,986, Cl. 435-255.000.
Phillips, Robert W. Guard for skinning knife. 4,601,102, Cl. 30-123.500.
Phillipson, John G., to Baker Perkins Holdings PLC. Handling of biscuits or like laminar articles. 4,601,383, Cl. 198-448.000.
Philpott, Arthur K.; and Poole, Gordon H., to Mark Sensing (Aust.) Pty. Limited. Non-aqueous compositions for heat-sensitive multilayer coatings. 4,602,265, Cl. 346-210.000.
Picker International, Limited: *See*—
Butson, Peter C., 4,602,234, Cl. 335-299.000.
Pierce, William C.; and West, Jack E., to Pitts Industries, Inc. Supporting bracket for hydraulic pump and clutch. 4,601,378, Cl. 192-115.000.
Pierrat, Frank A.: *See*—
Effland, Richard C.; and Pierrat, Frank A., 4,602,028, Cl. 514-379.000.
Pike, Roscoe A., to United Technologies Corporation. Polyimide matrix, fiber reinforced composite article and method of making the same. 4,601,945, Cl. 428-287.000.
Pillan, Antonio: *See*—
Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, 4,602,022, Cl. 514-337.000.
Pine, James J., to Action Industries, Inc. Rock-blocking mechanism for rocking chair. 4,601,513, Cl. 297-270.000.
Pioneer Electronic Corporation: *See*—
Moriyama, Yoshiaki; Gotoh, Toshio; and Hayashi, Hideki, 4,602,295, Cl. 358-343.000.
Piper Hydro, Inc.: *See*—
Piper, James R., 4,601,281, Cl. 126-437.000.
Piper, James R., to Piper Hydro, Inc. Hot water supply system. 4,601,281, Cl. 126-437.000.
Pipkin, Noel J.; and Elworthy, Trevor P. Abrasive bodies. 4,601,423, Cl. 228-121.000.
Pirlet, Robert A., to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Methods for conditioning metal products. 4,601,762, Cl. 148-9.500.
Pisinger, Milos: *See*—
Stratil, Tomas; Pisinger, Milos; and Fehr, Peter, 4,601,763, Cl. 148-23.000.
Pitney Bowes Inc.: *See*—
Sette, Paul R., 4,601,240, Cl. 101-91.000.
Pittman, Roland, to Singer Company, The. Linear acceleration compensation for multisensor. 4,601,205, Cl. 73-505.000.
Pitts Industries, Inc.: *See*—
Pierce, William C.; and West, Jack E., 4,601,378, Cl. 192-115.000.
Plante, Roland L.; and McKenney, Austin L., to United States of America, Air Force. Vibration isolator actuator for a segmented mirror. 4,601,554, Cl. 350-611.000.
Pletsch, Hubert: *See*—
Wolf, Franz J.; and Pletsch, Hubert, 4,601,678, Cl. 464-83.000.
Podvin, T. Charles: *See*—
Pettingell, James T.; and Podvin, T. Charles, 4,601,551, Cl. 350-525.000.
Pogany, Janos: *See*—
David, Agoston; Kovacs, Ferenc; and Pogany, Janos, 4,601,866, Cl. 264-109.000.
Polaroid Corporation: *See*—
Borror, Alan L.; Ellis, Ernest W.; and McGowan, Donald A., 4,602,263, Cl. 346-201.000.
Pollitz, Hilda S., to Teleflora Corporation. Container with invertible lid. 4,601,403, Cl. 215-228.000.
Poltavsky Zavod Gazorazryadnykh Lamp Imeni Komsomola Ukrainy: *See*—
Roiz, Lev M.; Petukhov, Mikhail M.; and Kagansky, Arkady I., 4,602,185, Cl. 313-25.000.
Ponikwia, Edward F.: *See*—
Stottmann, Richard L.; Ponikwia, Edward F.; and Weigl, William, 4,601,429, Cl. 241-92.000.
Ponticello, Gerald S.: *See*—
Baldwin, John J.; Ponticello, Gerald S.; and Christy, Marcia E., 4,602,093, Cl. 548-336.000.
Poole, Gordon H.: *See*—
Philpott, Arthur K.; and Poole, Gordon H., 4,602,265, Cl. 346-210.000.
Popelka, David A.: *See*—
Yen, Jing G.; and Popelka, David A., 4,601,639, Cl. 416-230.000.
Porcelli, Anthony J., to Mattel, Inc. Sound reproduction unit with magnetic governor. 4,602,360, Cl. 369-63.000.
Possis Medical, Inc.: *See*—
Possis, Zinon C.; and Nicoloff, Demetre M., 4,601,718, Cl. 623-1.000.
Possis, Zinon C.; and Nicoloff, Demetre M., to Possis Medical, Inc. Vascular graft and blood supply method. 4,601,718, Cl. 623-1.000.
Poterala, Robert J. Apparatus and method for uniformly coating an irregular web. 4,601,256, Cl. 118-126.000.
Powers, John H.; and Dang, Hang T., to Aluminum Company of America. High reflectance semi-specular anodized aluminum alloy product and method of forming same. 4,601,796, Cl. 204-33.000.
Powers, Michael A.: *See*—
Foster, Michael L.; Foster, Harold L.; and Powers, Michael A., 4,602,248, Cl. 340-601.000.
PPG Industries, Inc.: *See*—
Harper, J. Cletus, 4,602,239, Cl. 338-316.000.
Krogh, James A., 4,601,860, Cl. 260-550.000.
Sienkowski, Kenneth J.; and Thompson, Ralph B., 4,602,111, Cl. 564-433.000.
Prats, Michael; and Ritter, Paul B., Jr., to Shell Oil Company. Foam and impedance-guided steam injection. 4,601,338, Cl. 166-278.000.
Prendergast, John F.: *See*—
Kelman, Arnold L.; Prendergast, John F.; Stevens, Edward P.; and Lang, George R., 4,602,378, Cl. 378-26.000.
Priaroggia, Paolo G., to Societa' Cavi Pirelli S.p.A. Oil-filled electric cable with alternate layers of plastic and paper tape insulation. 4,602,121, Cl. 174-25.00R.
Price, Ronald W.: *See*—
McKay, Glen; Smith, Henry F.; Price, Ronald W.; and Keshavjee, Firoz A., 4,601,208, Cl. 73-829.000.
Pricone, Robert M.; and Roberts, William N., to Amerace Corporation. Methods and apparatus for embossing a precision optical pattern in a resinous sheet or laminate. 4,601,861, Cl. 264-1.600.
Prime Computer, Inc.: *See*—
Bahr, Richard G.; Kinney, Daryl F.; Nemeth, Alan G.; and Raizen, Helen S., 4,601,586, Cl. 370-94.000.
White, Robert J.; and Roberts, Ross E., 4,602,365, Cl. 370-89.000.
Primrose, Matthew J., to Shell Oil Company. Sandjet rotating nozzle. 4,601,612, Cl. 405-226.000.
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Pritchard, Dalton H.; and Sauer, Donald J., to RCA Corporation. Non-linear processor for video signal vertical detail component. 4,602,278, Cl. 358-37.000.
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Privat, Michel. Installation for cleaning clothes and removal of particulate contaminants especially from clothing contaminated by radioactive particles. 4,601,181, Cl. 68-18.00C.
Proconics International, Inc.: *See*—
Foulke, Richard F., 4,601,521, Cl. 384-54.000.
Procter & Gamble Company, The: *See*—
Blevins, John M., 4,601,717, Cl. 604-358.00A.
Cilley, William A., 4,601,844, Cl. 252-95.000.
Radel, Clifford J.; and Thompson, Hugh A., 4,601,868, Cl. 264-504.000.
Proctor, Paul W.; and Dow, Robert L., to United States of America, Navy. Nozzle for self-contained cutting torches. 4,601,761, Cl. 148-9.00R.

Progenics, Inc.: *See—*
Krsek, George, 4,602,008, Cl. 514-178.000.
Proprietary Technology: *See—*
Bartholomew, Donald D., 4,601,497, Cl. 285-319.000.
Protectaire Systems Co.: *See—*
Napadow, Stanley C., 4,601,236, Cl. 98-115.200.
Pryor, Timothy R. Electro-optical systems for control of robots, manipulator arms and co-ordinate measuring machines. 4,602,163, Cl. 250-561.000.
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Durrschnabel, Wolfgang; Stuer, Heinrich; Steeb, Jorg; and Puckert, Franz J., 4,601,879, Cl. 420-473.000.
Purcell, John R.; and Hsu, Yen-hwa, to GA Technologies Inc. Spaced stabilizing means for a superconducting switch. 4,602,231, Cl. 335-216.000.
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Streuff, Bernhard; and Putter, Johann, deceased, 4,601,895, Cl. 424-35.000.
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Pyysalo, Tapani: *See—*
Noponen, Asko K.; and Pyysalo, Tapani, 4,601,900, Cl. 424-54.000.
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Kellar, Paul R. N.; and Searby, Anthony D., 4,602,286, Cl. 358-183.000.
Quest Medical, Inc.: *See—*
Abbott, Martyn S., 4,602,249, Cl. 340-605.000.
Hudson, James E., 4,601,702, Cl. 604-246.000.
Thompson, Thomas C.; Gula, John A.; and Meyer, Jack E., 4,601,700, Cl. 604-65.000.
R. A. Jones & Co. Inc.: *See—*
Greenwell, Joseph D., 4,601,691, Cl. 493-313.000.
R. Alkan & Cie: *See—*
Duclos, Didier A.; and Coutin, Pierre F., 4,601,445, Cl. 244-137.00A.
Raasch, Hans. Spinning device. 4,601,166, Cl. 57-401.000.
Radel, Clifford J.; and Thompson, Hugh A., to Procter & Gamble Company, The. Method of imparting a three-dimensional fiber-like appearance and tactile impression to a running ribbon of thermoplastic film. 4,601,868, Cl. 264-504.000.
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Zaiser, Adolf; Raichle, Dieter; Schwaiger, Helmut; Hermann, Adolf; and Bischof, Edgar, 4,601,104, Cl. 30-475.000.
Rainhart Company: *See—*
Hamilton, Edward R., 4,601,352, Cl. 173-124.000.
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Bahr, Richard G.; Kinney, Daryl F.; Nemeth, Alan G.; and Raizen, Helen S., 4,601,586, Cl. 370-94.000.
Ramsey, Everett M.: *See—*
Robak, Casimir B.; Ramsey, Everett M.; Beil, Gary A.; and Gray, Bruce A., 4,601,750, Cl. 75-65.00R.
Ramsey, Russel G., to Central Plastics Company. Thermoplastic fitting electric heat welding method and apparatus. 4,602,148, Cl. 219-535.000.
Ranalli, Joseph R.: *See—*
Adwalpalker, Avinash S.; Harvilchuck, Joseph M.; Ranalli, Joseph R.; and Rich, David W., 4,601,424, Cl. 228-124.000.
Rando, Joseph F., to Spectra-Physics, Inc. Laser diode mounting system. 4,601,452, Cl. 248-178.000.
Rankel, Lillian A., to Mobil Oil Corporation. Upgrading heavy hydrocarbon oils using sodium hypochlorite. 4,601,816, Cl. 208-253.000.
Ranken, Paul F.: *See—*
McKinnie, Bonnie G.; and Ranken, Paul F., 4,602,113, Cl. 568-54.000.
Rappoldt, Menso P.; and Mos, Gerardus H. M., to Duphar International Research B.V. Method of preparing 9β, 10α-5,7-diene steroids. 4,601,855, Cl. 260-239.55C.
Rastogi, Prabhat K.; and Lyudkovsky, Grigory, to Inland Steel Company. Low loss electrical steel strip and method for producing same. 4,601,766, Cl. 148-111.000.
Ratcliffe, Maurice J.; Shaw, Derek J.; and Robinson, Peter A., to Imperial Chemical Industries PLC. Photopolymerizable compositions. 4,602,076, Cl. 522-7.000.
Raubinger, Gerhard: *See—*
Karning, Heinrich; Raubinger, Gerhard; and Weigel, Wolfgang, 4,601,540, Cl. 350-266.000.
Rausing, Hans; and Nilsson, Ingvar, to Suecia Antiqua Limited. Method and apparatus for the manufacture of paper sheets having decorative edges. 4,601,692, Cl. 493-355.000.
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Acampora, Alfonse; and Petri, Robert J., 4,602,274, Cl. 358-11.000.
Carlson, Curtis R., 4,602,273, Cl. 358-11.000.
Clark, Raymond N.; and Schmitz, Anthony N., 4,602,227, Cl. 333-109.000.
Covey, Robert L.; Gale, Michael T.; Gorog, Istvan; and Beltz, John P., 4,601,581, Cl. 356-383.000.
Dingwall, Andrew G. F., 4,602,241, Cl. 340-347.0AD.
Duschl, Robert A., 4,602,272, Cl. 358-10.000.
Feick, Walter B., 4,602,316, Cl. 361-412.000.
Fling, Russell T.; Willis, Donald H.; and McNeely, David L., 4,602,276, Cl. 358-27.000.
Nan Chang, Kern K., 4,602,186, Cl. 313-407.000.
Nichols, David B., Jr., 4,601,727, Cl. 8-477.000.
Palmer, Richard C., 4,602,359, Cl. 369-58.000.
Pritchard, Dalton H.; and Sauer, Donald J., 4,602,278, Cl. 358-37.000.
Smith, Terrence R.; and Limberg, Allen L., 4,602,275, Cl. 358-11.000.
Redlich, Robert W., to Sunpower, Inc. Electromechanical transducer particularly suitable for a linear alternator driven by a free-piston stirling engine. 4,602,174, Cl. 310-15.000.
Redondo Investment Limited: *See—*
Tomkin, Douglas; and Pavlovic, Mica, 4,602,320, Cl. 362-80.000.
Redpath, Thomas W. T.: *See—*
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,602,214, Cl. 324-309.000.
Reed, Russell, Jr.; Chan, May L.; and Moore, Kenneth L., to United States of America, Navy. Pyrotechnic fire extinguishing method. 4,601,344, Cl. 169-47.000.
Reese, Morris. System for editing commercial messages from recorded television broadcasts. 4,602,297, Cl. 360-14.100.
Regan, Robert J.; Butler, Scott J.; and Ben-Aharon, Zvi, to GTE Laboratories Incorporated. High frequency energy source. 4,602,221, Cl. 331-117.00R.
Regelman, Dale F., to Dow Chemical Company, The. Novel product and process of isocyanurate production. 4,602,049, Cl. 521-129.000.
Regina, Francis J.: *See—*
Galle, James E.; Mares, Frank; Diamond, Steven E.; Corsi, Jeffrey; and Regina, Francis J., 4,601,859, Cl. 558-459.000.
Reik, Wolfgang, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,601,376, Cl. 192-89.00B.
Reinbold, James F.; and Upshaw, Clarence W., to UNR Industries, Inc. Combination shopping cart and stock cart. 4,601,479, Cl. 280-33.99H.
Renaud, Pierre; and Lassiaz, Philippe, to Valeo. Friction clutch. 4,601,379, Cl. 192-89.00B.
Renold PLC: *See—*
Oldfield, Benjamin D.; Owen, Phillip J.; and Hague, Colin, 4,601,266, Cl. 123-90.150.
Research Activities, Incorporated: *See—*
Appelberg, Gustaf T., 4,602,340, Cl. 364-492.000.
Research Corporation: *See—*
Vieth, Wolf R.; Wang, Shaw S.; and Gilbert, Seymour G., 4,601,981, Cl. 435-94.000.
Retallick, William B.; and Dunbar, F. Curtiss, to Retallick, William B. Metal support for a catalyst. 4,601,999, Cl. 502-314.000.
Rettig, Thomas A.: *See—*
Buser, Kenneth R.; and Rettig, Thomas A., 4,602,046, Cl. 521-46.000.
Rexnord Inc.: *See—*
Martin, Donald E., 4,601,412, Cl. 222-256.000.
Reyner, Peter J.: *See—*
Dean, Robert; Reyner, Peter J.; and Hutchinson, Derek, 4,601,380, Cl. 194-318.000.
Reynolds, Robert J.: *See—*
Gibbs, Richard; Reynolds, Robert J.; and Greenhaw, Kevin, 4,601,391, Cl. 206-314.000.
Rheometrics, Inc.: *See—*
Garritano, Ronald F., 4,601,195, Cl. 73-60.000.
Rhoads, Gary E. Variable two-way bleed valve. 4,601,268, Cl. 123-90.550.
Rhone-Poulenc Specialites Chimiques: *See—*
Jacubert, Serge; Grosbois, Jean; and Verdier, Jean-Michel, 4,601,798, Cl. 204-61.000.
Melard, Pierre; Peltier, Marcel; and Tastu, Francis, 4,601,755, Cl. 106-3.000.
Rich, David W.: *See—*
Adwalpalker, Avinash S.; Harvilchuck, Joseph M.; Ranalli, Joseph R.; and Rich, David W., 4,601,424, Cl. 228-124.000.
Richey, Jarold L., to Harris Graphics Corporation. Apparatus for crimping a moving web. 4,601,693, Cl. 493-370.000.
Ricketts, William J.: *See—*
Fattic, Gerald T.; Dennis, David S.; and Ricketts, William J., 4,601,197, Cl. 73-117.300.
Ricoh Company, Ltd.: *See—*
Hamaguchi, Iwao, 4,602,237, Cl. 338-20.000.
Ide, Yukio; and Ohseto, Seiichi, 4,601,965, Cl. 430-85.000.
Kondoh, Shiroh, 4,601,258, Cl. 118-652.000.
Suzuki, Akira; Kobayashi, Kazuo; and Enoki, Sigekazu, 4,601,967, Cl. 430-107.000.
Takahashi, Michio; Tanaka, Mitsuo; Kanno, Fuchio; and Kobayashi, Kazuo, 4,601,963, Cl. 430-69.000.
Yamane, Satoshi; and Suzuki, Toshitatsu, 4,601,574, Cl. 356-1.000.
Rieger, Franz: *See—*
Damson, Eckart; Franke, Horst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,601,276, Cl. 123-489.000.
Riemer, Gerald K., to Boeing Company, The. Closure system for a containerized cargo handling sleeve. 4,601,405, Cl. 220-1.500.
Riemer, Jed A.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., 4,602,095, Cl. 548-532.000.
Rieter Machine Works, Ltd.: *See—*
Bischofberger, Jurg; and Lattion, Andre , 4,601,164, Cl. 57-263.000.
Riley, Eric K.; Dudill, Roger; and Young, Philip J., to Air Products and Chemicals, Inc. Heating apparatus. 4,601,655, Cl. 431-116.000.
Riley, Morgan S.: *See—*
Circello, Joseph C.; Wilhite, John E.; Shelly, William A.; and Riley, Morgan S., 4,602,368, Cl. 371-21.000.

Riolfo, Benedetto: *See—*
Corgnier, Luigi; Riolfo, Benedetto; and Guglielmo, Mario, 4,602,283, Cl. 358-119.000.

Risi, Angelo; and Risi, Antonio. Module for walls and free standing structure. 4,601,148, Cl. 52-284.000.

Risi, Antonio: *See—*
Risi, Angelo; and Risi, Antonio, 4,601,148, Cl. 52-284.000.

Ritter, Paul B., Jr.: *See—*
Prats, Michael; and Ritter, Paul B., Jr., 4,601,338, Cl. 166-278.000.

Ritz, Josef: *See—*
Weiss, Franz-Josef; Habermann, Wolfgang; Hammes, Peter; Ritz, Josef; Thomas, Erwin; and Thoma, Peter, 4,601,800, Cl. 204-182.400.

Robak, Casimir B.; Ramsey, Everett M.; Beil, Gary A.; and Gray, Bruce A., to Aluminum Company of America. Scrap melting system. 4,601,750, Cl. 75-65.00R.

Robb, Francine Y., to Motorola, Inc. Maskless etching of polysilicon. 4,601,778, Cl. 156-628.000.

Robbiati, Giandaniele: *See—*
Fertell, Paul A.; McCartney, John; and Robbiati, Giandaniele, 4,601,951, Cl. 428-423.400.

Robert Bosch GmbH: *See—*
Damson, Eckart; Franke, Horst; Maurer, Helmut; Muller, Klaus; and Rieger, Franz, 4,601,276, Cl. 123-489.000.
Denz, Helmut, 4,601,199, Cl. 73-118.000.

Roberts, Emmett T., to TRW Inc. Reciprocating pump piston. 4,601,235, Cl. 92-245.000.

Roberts, Melvin F., to Bloomfield Industries, Inc. Tap-off hot water system for electric beverage making device. 4,602,145, Cl. 219-297.000.

Roberts, Ross E.: *See—*
White, Robert J.; and Roberts, Ross E., 4,602,365, Cl. 370-89.000.

Roberts, William E.; and Nelson, Alfred M., to Excellon Industries. Pick-station and feed apparatus in pick-and-place machine. 4,601,382, Cl. 198-432.000.

Roberts, William N.: *See—*
Pricone, Robert M.; and Roberts, William N., 4,601,861, Cl. 264-1.600.

Robertshaw Controls Company: *See—*
Gunter, James C., 4,601,090, Cl. 29-243.500.

Robertson, John C.; and Santarsiero, Paul S., to Coleco Industries, Inc. Simulated flying figure with movable wings. 4,601,478, Cl. 280-1.130.

Robinson, Donald E. Mechanized toy ball. 4,601,675, Cl. 446-449.000.

Robinson, John F.: *See—*
Campbell, Colin T.; Clements, Richard J.; Robinson, John F.; and Waring, Alan J., 4,601,610, Cl. 405-188.000.

Robinson, Peter A.: *See—*
Ratcliffe, Maurice J.; Shaw, Derek J.; and Robinson, Peter A., 4,602,076, Cl. 522-7.000.

Robinson, Roy S.: *See—*
Dorfman, Walter, 4,602,373, Cl. 272-129.000.

Rock, Erich, to Julius Blum Gesellschaft m.b.H. Pull-out guide assembly for drawers or the like. 4,601,522, Cl. 384-19.000.

Rockwell-Golde G.m.b.H: *See—*
Grimm, Rainer; and Bohm, Horst, 4,601,091, Cl. 29-423.000.

Rockwell International Corporation: *See—*
Fadner, Thomas A., 4,601,242, Cl. 101-348.000.
McDermott, Thomas C., III, 4,602,367, Cl. 370-106.000.

Roeland, Robert: *See—*
Grimes, Thomas L.; Roeland, Robert; and Schadewald, Frederic H., 4,601,802, Cl. 204-212.000.

Rogers, David L.: *See—*
Hart, C. Jack; Murray, Lawrence K.; Rogers, David L.; and Divis, Richard T., 4,601,892, Cl. 423-456.000.

Rogers, John B.: *See—*
Gvoich, William; and Rogers, John B., 4,601,467, Cl. 272-130.000.

Rogge, William H.: *See—*
Juvinall, John W.; Lovalenti, Sam; and Rogge, William H., 4,601,395, Cl. 209-526.000.

Rohm and Haas Company: *See—*
Hung, Ju-Ming, 4,602,083, Cl. 528-488.000.

Rohrich, Heinz: *See—*
Gebald, Georg; Rohrich, Heinz; Dippold, Clemens; and Forner, Siegfried, 4,601,133, Cl. 51-135.00R.

Roiz, Lev M.; Petukhov, Mikhail M.; and Kagansky, Arkady I., to Poltavsky Zavod Gazorazryadnykh Lamp Imeni Komsomola Ukrainy. Arc tube support of gaseous-discharge lamp. 4,602,185, Cl. 313-25.000.

Rokosz, Leo F.: *See—*
Wallace, Leslie E.; Rokosz, Leo F.; and Stacy, Charles L., Jr., 4,602,072, Cl. 526-77.000.

Romero, Antonio, to Saft America, Inc. Vent construction for batteries. 4,601,959, Cl. 429-56.000.

Rose, Allan F., to Chevron Research Company. Fungicidal 2-substituted-1-(1-imidazolyl)-propyl aryl sulfides, sulfoxides and sulfones. 4,602,030, Cl. 514-399.000.

Rose, Selwyn H.: *See—*
Carr, Lawrence J.; Nichols, George M.; and Rose, Selwyn H., 4,601,843, Cl. 252-78.500.

Rosenberg, Richard W. Switch assembly for maintaining an electric time switch clock synchronized with real time. 4,602,165, Cl. 307-141.000.

Rosenthal, Roberta; and Dubourcq, Hilaire H. Collapsible hand carrier for bottles. 4,601,390, Cl. 206-175.000.

Ross, Gunther: *See—*
Klingler, Otto; and Ross, Gunther, 4,601,109, Cl. 33-517.000.

Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., to General Dynamics, Pomona Division. Electrically-isolating coupler suitable for high pressure cryogenic gas flow. 4,601,493, Cl. 285-53.000.

Roth, Roger Z.: *See—*
Flotow, Richard A.; and Roth, Roger Z., 4,601,377, Cl. 192-110.00R.

Rothfuss, Hermann: *See—*
Wenzlick, Erich; and Rothfuss, Hermann, 4,601,523, Cl. 312-330.00R.

Rouille, Claude: *See—*
Doucet, Henri J.; Gazaix, Michel; Lamain, Henri; Rouille, Claude; and Furtlehner, Jean-Pierre, 4,602,376, Cl. 378-119.000.

Rouland, Daniel: *See—*
Fournot, Bernard; Le Bozec, Francois; and Rouland, Daniel, 4,601,204, Cl. 73-432.00R.

Roussel Uclaf: *See—*
Buendia, Jean; and Vivat, Michel, 4,601,854, Cl. 260-239.500.
Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, 4,602,038, Cl. 514-521.000.

Rovnyak, Richard M.; and Traina, Anthony, to GTE Communication Systems Corporation. Printed wiring board connector. 4,602,317, Cl. 361-413.000.

Rowe, Gavin B.: *See—*
Deacon, Martin J.; Forrest, Geoffrey; and Rowe, Gavin B., 4,601,938, Cl. 428-153.000.

Roy, Jean-Yves. Device for stimulating the human respiratory system. 4,601,465, Cl. 272-99.000.

Royal Appliance Mfg. Co.: *See—*
Morton, William J., Jr., 4,601,735, Cl. 55-377.000.

Royce, George H., Jr. Heated survival face mask. 4,601,287, Cl. 128-204.170.

RPR Filtration Systems, Inc.: *See—*
Nukala, August R.; Perez, Arthur; and Brumfield, Timothy L., 4,601,381, Cl. 196-114.000.

Rubber- en Kunststoffabriek ENBI B. V.: *See—*
Delhaes, Johannes C., 4,601,685, Cl. 474-188.000.

Russell, Kenneth W.: *See—*
Chiarizzio, Samuel J.; and Russell, Kenneth W., 4,601,289, Cl. 128-305.000.

Russo, David A.; and Lindner, Georg H., to M&T Chemicals Inc. Liquid coating composition for producing high quality, high performance fluorine-doped tin oxide coatings. 4,601,917, Cl. 427-109.000.

Russo, Robert W. Lawn edging system. 4,601,140, Cl. 52-102.000.

Ruti-te Strake B.V.: *See—*
Aarts, Hubertus H., 4,601,313, Cl. 139-194.000.

Ruzic, Ivo: *See—*
Natterer, Johann; and Ruzic, Ivo, 4,601,421, Cl. 226-173.000.

Ryaboshtan, Jury S.; and Takhtamirov, Evgeny P., to Tematicheskaya Expeditsia Proizvodstvennogo Obiedinenia "Ukrulegeologia" . Electromagnetic field method of detecting contemporary geodynamic movements in massif. 4,602,215, Cl. 324-334.000.

Rydstad, Hans: *See—*
Kunzli, Roland; and Rydstad, Hans, 4,601,186, Cl. 72-21.000.

S. T. Dupont: *See—*
Calgaro, Honore, 4,601,656, Cl. 431-344.000.

Sabol, Albert R.: *See—*
Valcho, Joseph J.; Lindberg, Steven E.; Hunt, Mack W.; and Sabol, Albert R., 4,601,837, Cl. 252-40.700.

Saccocio, Sean M., to Ohio State University Research Foundation. Apparatus and methods for forming images and for optical demultiplexing. 4,601,537, Cl. 350-96.270.

Sace, Incorporated: *See—*
Atkinson, Roger F.; Dennison, Steven C.; Welch, William D., Jr.; and Jolly, Ronald L., 4,602,134, Cl. 179-175.10R.

Saegusa, Takashi, to Nippon Kogaku K. K. Exposure control apparatus for camera. 4,601,567, Cl. 354-443.000.

Saeki, Keiso: *See—*
Mitsuo, Hirofumi; and Saeki, Keiso, 4,601,920, Cl. 427-150.000.

Saeki, Masaru: *See—*
Kaneko, Tetsuya; Saeki, Masaru; Tanaka, Kiyoshi; and Kawakita, Tetsuya, 4,601,829, Cl. 210-638.000.

Saft America, Inc.: *See—*
Romero, Antonio, 4,601,959, Cl. 429-56.000.

Sagawa, Masato: *See—*
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 4,601,875, Cl. 419-23.000.

Sagiyama, Masaru: *See—*
Fukuda, Shuzo; Ohkubo, Yutaka; Ishii, Toshio; Sagiyama, Masaru; and Tonouchi, Akira, 4,601,801, Cl. 204-206.000.

Saito, Isao: *See—*
Yamanaka, Motosuke; Saito, Isao; Yamatsu, Kiyomi; and Fujimoto, Takako, 4,602,031, Cl. 514-399.000.

Saito, Katsumi: *See—*
Murakami, Fumitune; and Saito, Katsumi, 4,602,369, Cl. 371-25.000.

Saito, Shunji; and Ichitani, Tetsuro, to Tokyo Electric Co., Ltd. Two sided magnetic disk drive apparatus with controlled timing means. 4,602,301, Cl. 360-69.000.

Saito, Syuichiro, to Canon Kabushiki Kaisha. Recording apparatus with device for detecting the status of a recording medium. 4,602,299, Cl. 360-60.000.

Saito, Takashi: *See—*
Kumaki, Takashi; and Saito, Takashi, 4,602,361, Cl. 369-77.200.

Saito, Yoichi: *See—*
Nakamura, Yasuhisa; and Saito, Yoichi, 4,602,374, Cl. 375-17.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member comprising layer of A-Si/A-Si(Ge)/A-Si(O). 4,601,964, Cl. 430-84.000.

Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, to Murata Manufacturing Co., Ltd. Dielectric ceramic composition. 4,601,988, Cl. 501-134.000.

Sakabe, Yukio; Nishioka, Goro; and Imanari, Junichi, to Murata Manufacturing Co., Ltd. Dielectric ceramic composition. 4,601,989, Cl. 501-136.000.

Sakai, Masao; Sugimoto, Makoto; Hashizume, Miyakazu; Tanaka, Yutaka; and Ito, Yukihiko, to NGK Spark Plug Co., Ltd. Resistor compositions for producing a resistor in resistor-incorporated spark plugs. 4,601,848, Cl. 252-503.000.

Sakai, Tadashi: *See—*
Suyama, Tomio; and Sakai, Tadashi, 4,601,178, Cl. 62-347.000.

Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, to Nippon Piston Ring Co., Ltd. Hollow rotor for movable vane pumps and the like and method of making the same. 4,601,647, Cl. 418-259.000.

Sakamoto, Nagayoshi; and Kugimoto, Junichi, to UBE Industries, Ltd. Process for the recovery of heavy metal. 4,601,889, Cl. 423-7.000.

Salesky, Leonard. Vehicle travel control device. 4,602,334, Cl. 364-424.000.

Salinas Valley Engineering & Mfg., Inc.: *See—*
Parry, Curtis L.; and Cushing, Gary R., 4,601,156, Cl. 53-399.000.

Sameshima, Yoshinobu: *See—*
Yoneyama, Saburo; Fujita, Masami; Ishii, Shizuo; Kichima, Mutsuhito; Takahashi, Yoshiharu; and Sameshima, Yoshinobu, 4,601,562, Cl. 354-170.000.

Sanderson, John R.: *See—*
Yeakey, Ernest L.; and Sanderson, John R., 4,602,102, Cl. 560-179.000.

Sandhu, M. Akram: *See—*
Grashof, Hans R.; Kan, Hsin-Chia; Sandhu, M. Akram; Wright, John F.; and Yacobucci, Paul D., 4,601,966, Cl. 430-109.000.

Sandoz Ltd.: *See—*
Giger, Rudolf K. A., 4,602,032, Cl. 514-410.000.

Sankyo Manufacturing Company, Ltd.: *See—*
Kato, Heizaburo, 4,601,420, Cl. 226-154.000.

Sano, Konosuke: *See—*
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Sargentini, Constantine. Novelty ski hat. 4,601,070, Cl. 2-209.000.

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Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, to Hitachi, Ltd. Gas laser generator. 4,602,372, Cl. 372-58.000.

Sasaki, Nobuyoshi, to M.C.L. Co., Ltd. Injection molding process. 4,601,870, Cl. 264-572.000.

Sasser, Martin V., Jr. Balance board with roller retainer pin. 4,601,469, Cl. 272-146.000.

Sateba International S.A.: *See—*
Guitaut, Francois P.; and Cazenave, Claude M., 4,601,092, Cl. 29-456.000.

Sato, Masaaki, to Olympus Optical Co., Ltd. Car stereo set. 4,602,358, Cl. 369-12.000.

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Saub, Jerry C. Soybean cooking process. 4,601,910, Cl. 426-634.000.

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Sawyer, David A.; Baxter, Martin G.; and Miller, Alistair A. Substituted aromatic compounds. 4,602,017, Cl. 514-242.000.

Saxton, Craig A. P. D., to Pfizer Inc. Prazosin-pirbuterol combination for bronchodilation. 4,601,897, Cl. 424-45.000.

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Schafer, Paul; and Berendt, Hans-Ulrich, to Ciba-Geigy Corporation. Process for pad dyeing cellulosic textile materials. 4,602,055, Cl. 524-157.000.

Schedele, Helmut, to Siemens Aktiengesellschaft. Polarized electromagnetic relay. 4,602,230, Cl. 335-79.000.

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Kruger, Hans-Rudolf; and Arndt, Friedrich, 4,601,748, Cl. 71-94.000.
Westermann, Jurgen; Boroschewski, Gerhard; Eder, Ulrich; Arndt, Friedrich; Krahmer, Hansjorg; and Kotter, Clemens, 4,601,746, Cl. 71-92.000.

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Scherm, Arthur; and Hummel, Klaus, to Merz+Co. GmbH & Co. Xanthates and antiviral use thereof. 4,602,037, Cl. 514-512.000.

Schiferl, David; Olinger, Barton W.; and Livingston, Robert W., to United States of America, Energy. Diamond-anvil high-pressure cell with improved X-ray collimation system. 4,602,377, Cl. 378-150.000.

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Schmitt, Gerd, to Lucas Industries. Pressure regulating valve for an hydraulic vehicle braking system. 4,601,520, Cl. 303-6.00C.

Schmitz, Anthony N.: *See—*
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Schnitzler, Frank D., to TRW Ehrenreich GmbH & Co., KG. Tie rod joint. 4,601,602, Cl. 403-56.000.

Schobl, Howard T. Valve assembly. 4,601,304, Cl. 137-315.000.

Schoppel, Roman; Mordau, Manfred; and Burk, Gerhard, to Daimler-Benz AG. Front body structure for motor vehicle. 4,601,510, Cl. 296-194.000.

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Zaiser, Adolf; Raichle, Dieter; Schwaiger, Helmut; Hermann, Adolf; and Bischof, Edgar, 4,601,104, Cl. 30-475.000.

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Gati, George S.; Lee, Albert P.; Schwartz, Geraldine C.; and Standley, Charles L., 4,601,939, Cl. 428-161.000.

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Sedgewick, Richard D. Method for winding wire coils on a toothed stack. 4,601,432, Cl. 242-7.030.
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Seidel, Gunter, to Aerzener Maschinenfabrik GmbH. Rotary compressor machines. 4,601,643, Cl. 417-247.000.
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Shimbo, Masafumi, 4,601,097, Cl. 29-572.000.
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Hayashi, Mikio; and Otsuka, Fumio, 4,601,594, Cl. 400-196.100.
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Seipke, Gerhard: *See*—
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Sekido, Satoshi; Tachibana, Hirokazu; and Ninomiya, Yoshito. Sensor element. 4,601,883, Cl. 422-94.000.
Sekine, Akio, to Kabushiki Kaisha Toshiba. Manuscript reading apparatus. 4,602,293, Cl. 358-280.000.
Sekine, Hirokazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid state image pick-up device. 4,602,289, Cl. 358-213.000.
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, to Nissan Motor Company, Limited. Method and system for detecting driver fatigue including differentiation of effects of rest periods. 4,602,247, Cl. 340-575.000.
Sella, Lino: *See*—
Berutto, Eugenio; Franchino, Giovanni; and Sella, Lino, 4,602,138, Cl. 200-340.000.
Sendzimir, Tadeusz. Work rolls for a strip mill having adjustable edge reliefs. 4,601,188, Cl. 72-243.000.
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Awata, Takashi; Maenaka, Tomio; and Kawamatsu, Yutaka, 4,602,026, Cl. 514-369.000.
Sensormedics Corporation: *See*—
Foster, Stuart L.; and Stillman, Gerald T., 4,601,293, Cl. 128-635.000.
Sentrol Systems Ltd.: *See*—
Mactaggart, John W., 4,602,160, Cl. 250-341.000.
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Sette, Paul R., to Pitney Bowes Inc. Print drum security system. 4,601,240, Cl. 101-91.000.
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Shannon, Thomas G.; and Brunelle, Daniel J., to General Electric Company. Method for preparing bischloroformate compositions. 4,601,858, Cl. 558-281.000.
Shapiro, Justin J. Precision micropipettor. 4,601,212, Cl. 73-864.180.
Sharbaugh, John E., to Westinghouse Electric Corp. Electric pipe snubber. 4,601,449, Cl. 248-58.000.
Sharman, Deborah A.: *See*—
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Shaw, Derek J.: *See*—
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Shaw, Herbert J.; Bergh, Ralph A.; and Kotler, George A., to Leland Stanford Junior University, The Board of Trustees of. Fiber optic directional coupler. 4,601,541, Cl. 350-320.000.
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Shelby, Billy L.; and Wirt, James R., to FL Industries, Inc. Laminated ballast core. 4,602,236, Cl. 336-216.000.
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Shell Offshore Inc.: *See*—
Ahlstone, Arthur G., 4,601,608, Cl. 405-169.000.
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Bannon, Robert P., 4,601,788, Cl. 202-153.000.
Campbell, Colin T.; Clements, Richard J.; Robinson, John F.; and Waring, Alan J., 4,601,610, Cl. 405-188.000.
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Shepard, John O. Polar mount antenna satellite tracking apparatus and method of alignment thereof. 4,602,259, Cl. 343-359.000.
Sheppard, William L., to AVM Corporation. Magnetic air valve. 4,601,458, Cl. 251-129.190.
Sheridan, John P. Automatic temperature control. 4,601,329, Cl. 165-22.000.
Sherman, Robert M.; and Fuerst, Charles O., to Aquaria, Inc. Free-standing aquarium filter. 4,601,821, Cl. 210-169.000.
Sheth, Jayesh V., to Burroughs Corporation. Magnetic tape-data link processor providing automatic data transfer. 4,602,331, Cl. 364-200.000.
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Shiio, Isamu; Sugimoto, Shinichi; and Kawamura, Kazue, to Ajinomoto Company Incorporated. Method for producing L-tryptophan by fermentation with a *brevibacterium flavum* mutant. 4,601,982, Cl. 435-108.000.
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Shimada, Shigeru; Kubota, Yuichi; and Nishimatsu, Masaharu, to TDK Corporation. Magnetic recording medium. 4,601,947, Cl. 428-336.000.
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Nagano, Masashi, 4,601,682, Cl. 474-80.000.
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Shimizu, Yoshio, to Sony Corporation. Signal comparing circuit. 4,602,169, Cl. 307-359.000.
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Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, 4,601,911, Cl. 427-34.000.
Shindler, Brian D., to Imperial Chemical Industries PLC. Extraction process. 4,601,906, Cl. 424-195.100.
Shingu, Hiroshi, to Seiko Epson Corporation. Liquid crystal display device having contrast-enhancing dye. 4,601,547, Cl. 350-349.000.
Shinkawa, Keiro, to Hitachi, Ltd. FM demodulator capable of shifting demodulation-band center frequency. 4,602,217, Cl. 329-122.000.
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Shioi, Shunsuke; Matoba, Gensuke; and Miyake, Makoto, to Kanzaki Paper Manufacturing Co., Ltd. Process for producing powder of microcapsules. 4,601,863, Cl. 264-4.300.
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Shirato, Takehide, to Fujitsu Limited. Protection element for semiconductor device. 4,602,267, Cl. 357-35.000.

Shivers, Horace L. Container and closure with tamper indicating means. 4,601,404, Cl. 215-230.000.

Shoji, Toyoshige; and Miyakawa, Tatsuo, to Fujitsu Limited. Fish processing apparatus. 4,601,083, Cl. 17-54.000.

Shriver, George R.: *See—*
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Shubert, Wesley M. Device for removing separated fluids and method for using same. 4,601,833, Cl. 210-744.000.

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Siegmann, Carl: *See—*
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Wawersig, Jurgen; and Kantz, Dieter, 4,602,353, Cl. 365-189.000.

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Sillars, Ian M. Apparatus for printing quasi random number tables. 4,601,239, Cl. 101-76.000.

Simon, Lionel N.; Mueller, Hans-Rudolf; and Zutter, Hans, to Newport Pharmaceuticals, Inc. Process for preparing purine compounds. 4,602,089, Cl. 544-265.000.

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Single, Peter S., to National Semiconductor Corporation. Low offset CMOS comparator circuit. 4,602,168, Cl. 307-355.000.

Sinskey, Robert M. Intraocular lens assembly. 4,601,720, Cl. 623-6.000.

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Sirota, Vladimir. Doll heart monitoring toy. 4,601,668, Cl. 446-130.000.

Siviglia, Nick C. Corneal contact lens for the eye of a patient with keratoconus disease and method of making the same. 4,601,556, Cl. 351-160.00R.

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Santen, Sven; Feinman, Jerome; and Eriksson, Sune, 4,601,752, Cl. 75-10.220.
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Small, Richard D., Jr., to AT&T Technologies, Inc. Photodefinable triazine based composition. 4,601,972, Cl. 430-280.000.

Smith, Gerald R.; and Allison, John E., Jr., to United States of America, Interior. Alloy coating method. 4,601,795, Cl. 204-16.000.

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Smith, J. Rudy. Emergency stretcher. 4,601,075, Cl. 5-82.00R.

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Smith, Lonnie W. Disposable sanitary sheath for males. 4,601,716, Cl. 604-349.000.

Smith, Steve. Transformer driving network with primary current limiting means. 4,602,166, Cl. 307-314.000.

Smith, Terrence R.; and Limberg, Allen L., to RCA Corporation. Television memory system. 4,602,275, Cl. 358-11.000.

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Snyder Laboratories, Inc.: *See—*
Olson, Daniel H., 4,601,715, Cl. 604-321.000.

Sobolewski, Antoni, to Mangels Industrial S.A. Induction fluid heater. 4,602,140, Cl. 219-10.510.

Societa' Cavi Pirelli S.p.A.: *See—*
Priaroggia, Paolo G., 4,602,121, Cl. 174-25.00R.

Societe Anonyme dite: L'Oreal: *See—*
Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, 4,601,901, Cl. 424-61.000.

Societe Carbochimique en abrege "CARBOCHIM": *See—*
Lambert, Pierre M.; and De Aguirre-Otegui, Ignacio, 4,602,080, Cl. 528-67.000.

Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.): *See—*
Esanu, Andre , 4,602,020, Cl. 514-302.000.

Societe de Dietrich: *See—*
Guerin, Jacky, 4,601,279, Cl. 126-21.00A.

Societe Francaise des Produits pour Catalyse Pro-Catalyse: *See—*
Dupin, Thierry; Caillod, Jacques; Leroux, Patrick; and Martino, Germain, 4,602,000, Cl. 502-335.000.

Societe Francaise Hoechst: *See—*
Blanc, Alain, 4,602,106, Cl. 562-444.000.

Societe Miniere et Metallurgique de Penarroya: *See—*
Palvadeau, Claude; and Scheidt, Claude, 4,601,805, Cl. 204-255.000.

Societe Nationale Industrielle et Aerospatiale: *See—*
Dumargue, Guy; and Comercon, Jean L., 4,601,422, Cl. 228-44.300.

Soileau, Trasimond A.; and Speaker, Lawrence W., to General Electric Company. Powdered iron core magnetic devices. 4,601,753, Cl. 75-251.000.

Soileau, Trasimond A.; and Speaker, Lawrence W., to General Electric Company. Powdered iron core magnetic devices. 4,601,765, Cl. 148-104.000.

Solomon, Jack, to Esselte Pendaflex Corporation. Frame for hanging files. 4,601,398, Cl. 211-46.000.

Sommer, Gordon M. Oil well pump. 4,601,640, Cl. 417-12.000.

Sommer, John G.: *See—*
Metcalf, Fredric D.; and Sommer, John G., 4,601,935, Cl. 428-57.000.

Sone, Kohki: *See—*
Kitahara, Tsuyoshi; and Sone, Kohki, 4,601,273, Cl. 123-440.000.

Sonnichsen, George C.: *See—*
Gier, Thurman E.; Shannon, Robert D.; and Sonnichsen, George C., 4,602,112, Cl. 564-474.000.

Sony Corporation: *See—*
Haruta, Masao, 4,602,302, Cl. 360-74.200.
Hayashi, Tsuneyuki; Yamauchi, Manabu; Tago, Kazuhide; Konishi, Toshio; and Hirai, Shinji, 4,601,433, Cl. 242-4.00R.
Kikuchi, Masafumi, 4,602,172, Cl. 307-494.000.
Shimizu, Yoshio, 4,602,169, Cl. 307-359.000.
Takayanagi, Yoshiyuki; and Takeda, Masashi, 4,602,244, Cl. 340-347.0DA.

Soulliard, Charles; Kelly, Kevin; and Lehman, Philip, to Midian Electronics, Inc. Touch tone decoder. 4,602,131, Cl. 179-84.0VF.

Sovonics Solar Systems: *See—*
Ovshinsky, Herbert, 4,601,260, Cl. 118-718.000.

Speaker, Lawrence W.: *See—*
Soileau, Trasimond A.; and Speaker, Lawrence W., 4,601,753, Cl. 75-251.000.
Soileau, Trasimond A.; and Speaker, Lawrence W., 4,601,765, Cl. 148-104.000.

Spearot, James A.: *See—*
Froberger, Charles F.; and Spearot, James A., 4,601,799, Cl. 204-181.800.

Spector, George: *See—*
Briscoe, Reginald; and Spector, George, 4,602,173, Cl. 310-1.000.

Spectra-Physics, Inc.: *See—*
Rando, Joseph F., 4,601,452, Cl. 248-178.000.

Spencer, Herbert J.: *See—*
Fukui, George M.; Spencer, Herbert J.; and Williams, Laurens R., II, 4,602,007, Cl. 514-159.000.

Spencer, Robin W.: *See—*
Krantz, Alexander; Tam, Tim F.; and Spencer, Robin W., 4,602,006, Cl. 514-63.000.

Speronello, Barry K., to Engelhard Corporation. Porous mullite. 4,601,997, Cl. 502-263.000.

Sperry, Elmer A., III; and Cluzel, John M., to Beckman Industrial Corporation. Monitoring port for ultraviolet water purification systems. 4,602,162, Cl. 250-436.000.

Spier, I. Martin. Hermetic self-locking electrical connector. 4,601,528, Cl. 339-38.000.

Stacy, Charles L., Jr.: *See—*
Wallace, Leslie E.; Rokosz, Leo F.; and Stacy, Charles L., Jr., 4,602,072, Cl. 526-77.000.

Stage, Hermann. Process for deodorizing and/or physical refining of cocoa butter and cocoa butter substitutes. 4,601,790, Cl. 203-6.000.

Stahl, Helmut. Machine equipped with a grinding band. 4,601,132, Cl. 51-135.0BT.

Stancato, Enzo. Album design and method of fabrication. 4,601,489, Cl. 281-21.00R.

Standley, Charles L.: *See—*
Gati, George S.; Lee, Albert P.; Schwartz, Geraldine C.; and Standley, Charles L., 4,601,939, Cl. 428-161.000.

Starnes, Dennis L.; Kimball, William G.; and Watson, Robert E., to Cannon Mills Company. Apparatus for automatically cutting apart successive articles. 4,601,225, Cl. 83-175.000.

Steadman, Michael; and Luck, Ronald H. Press knives. 4,601,228, Cl. 83-862.000.

Stebbings, David W., to CBS Inc. Compatible transmission techniques for FM stereophonic radio and television. 4,602,380, Cl. 381-13.000.

Stebbings, David W.: *See*—
Cugnini, Aldo G.; Gravereaux, Daniel W.; and Stebbings, David W., 4,602,381, Cl. 381-13.000.

Steblay, Bernard J., to United States of America, Interior. Measuring mine roof bolt strains. 4,601,207, Cl. 73-597.000.

Steeb, Jorg: *See*—
Durrschnabel, Wolfgang; Stuer, Heinrich; Steeb, Jorg; and Puckert, Franz J., 4,601,879, Cl. 420-473.000.

Steel, John B. Rings for fluid drive assemblies. 4,601,932, Cl. 428-36.000.

Stefani, Giannico: *See*—
Collina, Giancarlo; and Stefani, Giannico, 4,601,593, Cl. 400-121.000.

Steon Company: *See*—
Fertell, Paul A.; McCartney, John; and Robbiati, Giandaniele, 4,601,951, Cl. 428-423.400.

Sternberger, Joe E.: *See*—
Baker, Robert S.; and Sternberger, Joe E., 4,601,484, Cl. 280-411.00C.

Stevens, Edward P.: *See*—
Kelman, Arnold L.; Prendergast, John F.; Stevens, Edward P.; and Lang, George R., 4,602,378, Cl. 378-26.000.

Stier, Roger E.; Dunn, William H.; and Vidra, James D., to Beecham Inc. Aqueous solution containing TiF_4 and chelating agent. 4,601,898, Cl. 424-52.000.

Stier, Roger E.; Dunn, William H.; and Vidra, James D., to Beecham Inc. Hydrous toothpaste containing TiF_4 and chelating agent. 4,601,899, Cl. 424-52.000.

Stiffler, Scott; R.: *See*—
Abernathey, John R.; Lasky, Jerome B.; Nesbit, Larry A.; Sedgwick, Thomas O.; and Stiffler, Scott; R., 4,601,779, Cl. 156-628.000.

Stillman, Gerald T.: *See*—
Foster, Stuart L.; and Stillman, Gerald T., 4,601,293, Cl. 128-635.000.

Stinnett, John L. Routing apparatus. 4,601,619, Cl. 409-180.000.

Stirling, William L.: *See*—
Whealton, John H.; and Stirling, William L., 4,602,161, Cl. 250-423.00R.

Stoffelen, Eduardus, to Elektriciteit voor Goederenbehandeling Marine en Industrie, in het verkort: "Egemin", naamloze vennootschap. Measuring apparatus. 4,601,200, Cl. 73-290.00V.

Stone, Ralph S.; and Shelton, William S., to Joy Manufacturing Company. Ball valve with seat loading mechanism. 4,601,308, Cl. 137-315.000.

Stong, Randel E.; and Walinsky, Stanley W., to Pfizer Inc. High temperature drilling fluids. 4,602,067, Cl. 525-327.400.

Stoop, Guus: *See*—
Boute, Willem; Stoop, Guus; van Arragon, Gerrit W.; and Mensink, Kornelis A., 4,601,291, Cl. 128-419.0PT.

Stopinc Aktiengesellschaft: *See*—
Schiltknecht, Bruno; Arnold, Gebhard; Kagi, Otto; Fricker, Robert; and Troxler, Beat, 4,601,416, Cl. 222-600.000.

Stora Kopparbergs Bergslags AB: *See*—
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,601,786, Cl. 162-30.100.

Stork Screens B.V.: *See*—
van der Velden, Hendricus J., 4,601,928, Cl. 428-36.000.

Stotler, David V.; and Coffey, Fred S., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing a continuous glass filament mat. 4,601,741, Cl. 65-4.400.

Stottmann, Richard L.; Ponikwia, Edward F.; and Weigl, William, to KitchenAid, Inc. Concentric drive for food processing tool. 4,601,429, Cl. 241-92.000.

Stotts, Robert E., to Mechanical Technology Incorporated. Control apparatus for hot gas engine. 4,601,171, Cl. 60-521.000.

Stotts, Robert E., to Mechanical Technology Incorporated. Multiple volume compressor for hot gas engine. 4,601,172, Cl. 60-521.000.

Stratil, Tomas; Pisinger, Milos; and Fehr, Peter, to LGZ Landis & Gyr Zug AG. Method for the mechanical soft-soldering of heavy metals utilizing a fluxing agent. 4,601,763, Cl. 148-23.000.

Streuff, Bernhard; and Putter, Johann, deceased (by Putter, Elisabeth, sole heiress), to Bayer Aktiengesellschaft. Delayed-action acetylsalicylic acid formulations for oral administration. 4,601,895, Cl. 424-35.000.

Striegler, John H.: *See*—
Schuh, Frank J.; and Striegler, John H., 4,601,353, Cl. 175-41.000.

Stuer, Heinrich: *See*—
Durrschnabel, Wolfgang; Stuer, Heinrich; Steeb, Jorg; and Puckert, Franz J., 4,601,879, Cl. 420-473.000.

Stuever, Joseph H.: *See*—
Lowe, Steven P.; and Stuever, Joseph H., 4,601,455, Cl. 248-429.000.

Sturm, Elmar: *See*—
Heeres, Jan; Backx, Leo; Vana Laerhoven, Willy; and Sturm, Elmar, 4,602,010, Cl. 514-184.000.

Sturm, Ruger & Company, Inc.: *See*—
Brown, Edwards, Jr., 4,601,124, Cl. 42-75.030.

Suda, Kaoru: *See*—
Nakata, Yukio; and Suda, Kaoru, 4,602,252, Cl. 340-825.500.

Sudo, Taiji: *See*—
Shimamura, Norio; and Sudo, Taiji, 4,602,351, Cl. 365-52.000.

Suecia Antiqua Limited: *See*—
Rausing, Hans; and Nilsson, Ingvar, 4,601,692, Cl. 493-355.000.

Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Hydraulic servo device with built-in accumulator. 4,601,233, Cl. 92-52.000.

Sugars, David E.: *See*—
Luke, John A.; and Sugars, David E., 4,601,686, Cl. 493-43.000.

Sugawara, Hiroyuki: *See*—
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,602,372, Cl. 372-58.000.

Sugimoto, Makoto: *See*—
Sakai, Masao; Sugimoto, Makoto; Hashizume, Miyakazu; Tanaka, Yutaka; and Ito, Yukihiko, 4,601,848, Cl. 252-503.000.

Sugimoto, Shinichi: *See*—
Shiio, Isamu; Sugimoto, Shinichi; and Kawamura, Kazue, 4,601,982, Cl. 435-108.000.

Sugishita, Susumu: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,601,647, Cl. 418-259.000.

Sugiura, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic tuning circuit for nuclear magnetic resonance apparatus. 4,602,213, Cl. 324-307.000.

Sugiyama, Kenji: *See*—
Miyazaki, Takeshi; and Sugiyama, Kenji, 4,601,448, Cl. 248-56.000.

Sugiyama, Makoto, to Kai Cutlery Center Co., Ltd. Cutter having circular rotary blade. 4,601,103, Cl. 30-162.000.

Suld, George: *See*—
Lyons, James E.; and Suld, George, 4,602,104, Cl. 560-243.000.

Sulzer-Ruti Machinery Work, Ltd: *See*—
Gunneman, Paul, 4,601,314, Cl. 139-429.000.

Sumitomo Electric Industries, Ltd.: *See*—
Kikuchi, Kenichi; Iiyama, Michitomo; Ebata, Toshiki; and Hayashi, Hideki, 4,601,095, Cl. 29-571.000.
Nishikawa, Mitsuru, 4,601,548, Cl. 350-416.000.

Sumitomo Metal Industries, Ltd.: *See*—
Hiroshima, Tatsuo; and Hirota, Tetsuya, 4,602,212, Cl. 324-227.000.
Tsuda, Tetsuaki; Asano, Kazuo; Shibuya, Atsuyoshi; Nishihara, Minoru; Yanagi, Kenichi; Kato, Mitsuo; Yamada, Katsuhiko; and Fujisaka, Teijiro, 4,601,794, Cl. 204-15.000.

Sumitomo Special Metals Co., Ltd.: *See*—
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 4,601,875, Cl. 419-23.000.
Yamashita, Michio; and Fujimura, Setsuo, 4,601,876, Cl. 419-23.000.

Sun Refining and Marketing Company: *See*—
Lyons, James E., 4,602,103, Cl. 560-243.000.
Lyons, James E.; and Suld, George, 4,602,104, Cl. 560-243.000.

Sundheimer, Craig S., to American Sterilizer Company. Apparatus for liquid disinfecting and sterile rinsing. 4,601,300, Cl. 134-95.000.

Sunpower, Inc.: *See*—
Redlich, Robert W., 4,602,174, Cl. 310-15.000.

Sutton, Raymond K.; and Kelly, Reba A. Disposable utensil for cleaning and disinfecting toilet seats and other articles. 4,601,081, Cl. 15-104.940.

Suunto Oy: *See*—
Leinonen, Pertti, 4,601,106, Cl. 33-356.000.

Suyama, Tomio, to Hoshizaki Electric Co., Ltd. Water frozen and water depletion state sensor for an ice product making apparatus. 4,601,176, Cl. 62-138.000.

Suyama, Tomio; and Sakai, Tadashi, to Hoshizaki Electric Co., Ltd. Ice-making machine. 4,601,178, Cl. 62-347.000.

Suzuki, Akira; Kobayashi, Kazuo; and Enoki, Sigekazu, to Ricoh Company, Ltd. Toner particles having a relatively high specific volume resistivity coating layer. 4,601,967, Cl. 430-107.000.

Suzuki, Etsuji: *See*—
Gotou, Yukihiro; and Suzuki, Etsuji, 4,601,577, Cl. 356-237.000.

Suzuki, Kenji, to Canon Kabushiki Kaisha. Focus detection apparatus for a camera. 4,602,153, Cl. 250-201.000.

Suzuki, Masahiko: *See*—
Kuroyanagi, Masatoshi; Suzuki, Masahiko; and Iwata, Hiroshi, 4,601,641, Cl. 417-220.000.

Suzuki, Masao; Hashimoto, Kenichi; and Satoh, Tadashi, to Nippon Oil and Fats Company, Limited. Method of purifying oleic acid. 4,601,856, Cl. 260-419.000.

Suzuki, Shintaro: *See*—
Asami, Yoshiaki; Suzuki, Shintaro; Fujita, Hirotsugu; and Homma, Fumiko, 4,601,919, Cl. 427-126.300.

Suzuki, Takanori: *See*—
Endo, Hiroshi; Matsui, Hiroshi; and Suzuki, Takanori, 4,602,047, Cl. 521-58.000.

Suzuki, Toshitatsu: *See*—
Yamane, Satoshi; and Suzuki, Toshitatsu, 4,601,574, Cl. 356-1.000.

Svenska Vision AB: *See*—
Mattsson, Lars B. E., 4,601,454, Cl. 248-418.000.

Swales, Barton L.; and Boens, Richard L., to Deere & Company. Automatically engageable and disengageable drive coupler mechanism. 4,601,372, Cl. 192-67.00R.

Swanson, Neubert W. Spacer device. 4,601,108, Cl. 33-454.000.

Swearengen, Thomas F.; and Makauskas, Walter J., to O. F. Mossberg & Sons, Inc. Convertible shotgun. 4,601,123, Cl. 42-72.000.

Swed Sorb Corporation AB: *See*—
Eriksson, Hans, 4,601,825, Cl. 210-287.000.

Sweeney, Thomas F.: *See*—
Bell, James L., Jr.; Thatcher, Mark T.; Phillips, Brian K.; Brammer, Norman; and Sweeney, Thomas F., 4,601,491, Cl. 285-24.000.
Swiss Aluminium Ltd.: *See*—
Vire , Sylvestre, 4,601,804, Cl. 204-244.000.
Sykes, Richard B.: *See*—
Meyers, Edward; Liu, Wen-Chih; and Sykes, Richard B., 4,601,904, Cl. 424-118.000.
Sylla, Jurgen: *See*—
Hofmann, Wilfried; Holzmann, Andreas; Koopmann, Adolf; Meggendorfer, Ruth; and Sylla, Jurgen, 4,601,558, Cl. 353-27.00R.
Syntex (U.S.A.) Inc.: *See*—
Bertino, Cosmo D., III; and Marucci, N. Dominic, 4,601,664, Cl. 434-264.000.
Krantz, Alexander; Tam, Tim F.; and Spencer, Robin W., 4,602,006, Cl. 514-63.000.
Szeles, Lajos, to Interag RT. Skin regenerating composition and a process for the preparation thereof. 4,601,905, Cl. 424-195.100.
Tabacchi, Vittorio; and Viel, Vincenzo. Metal frame for eyeglasses. 4,601,555, Cl. 351-90.000.
Tachibana, Hirokazu: *See*—
Sekido, Satoshi; Tachibana, Hirokazu; and Ninomiya, Yoshito, 4,601,883, Cl. 422-94.000.
Tachikawa Spring Co., Ltd.: *See*—
Hatsutta, Susumu; and Yasui, Takashi, 4,601,515, Cl. 297-361.000.
Tada, Eiji: *See*—
Tanino, Mikio; Tada, Eiji; and Takano, Tsutomu, 4,601,177, Cl. 62-149.000.
Tadaaki Sakai: *See*—
Nagoshi, Kazunori, 4,601,909, Cl. 426-524.000.
Tadokoro, Eiichi: *See*—
Iida, Shinobu; Yamaguchi, Nobutaka; Tsukuda, Fumiaki; Fujiyama, Masaaki; and Tadokoro, Eiichi, 4,601,946, Cl. 428-323.000.
Tago, Kazuhide: *See*—
Hayashi, Tsuneyuki; Yamauchi, Manabu; Tago, Kazuhide; Konishi, Toshio; and Hirai, Shinji, 4,601,433, Cl. 242-4.00R.
Tagomori, Satoshi; and Uruta, Hisaya, to Bridgestone Corporation. Marine fender. 4,601,611, Cl. 405-215.000.
Takagi, Hiroshi: *See*—
Nakamori, Shigeru; Ishida, Masaaki; Takagi, Hiroshi; Miwa, Kiyoshi; Ito, Koichi; and Sano, Konosuke, 4,601,983, Cl. 435-115.000.
Takagi, Tomio: *See*—
Fujii, Tadaomi; Kitazawa, Koji; Tomono, Yutaka; Takagi, Tomio; and Kawachi, Josuke, 4,601,877, Cl. 419-42.000.
Takahara, Ichiro; Ono, Tomoyoshi; and Nakai, Makoto, to Matsumoto Kosan Kabushiki Kaisha. Temperature-indicating sheet. 4,601,588, Cl. 374-106.000.
Takahashi, Hiroto: *See*—
Matsuda, Hiroto; Shibata, Makoto; Ikeda, Masami; and Takahashi, Hiroto, 4,602,261, Cl. 346-140.00R.
Takahashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Control bus device. 4,602,312, Cl. 361-342.000.
Takahashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Control center with vertical control bus device. 4,602,313, Cl. 361-342.000.
Takahashi, Michiharu: *See*—
Naito, Yoshiyuki; and Takahashi, Michiharu, 4,602,141, Cl. 219-10.55D.
Takahashi, Michio; Tanaka, Mitsuo; Kanno, Fuchio; and Kobayashi, Kazuo, to Ricoh Company, Ltd. Locally deformable photosensitive drum for use in electrophotography. 4,601,963, Cl. 430-69.000.
Takahashi, Naoki, to Kabushiki Kaisha Ishida Koki Seisakusho. Electronic weigher. 4,601,355, Cl. 177-2.000.
Takahashi, Takeo: *See*—
Watanabe, Yasuo; Takahashi, Takeo; and Haga, Keiji, 4,601,431, Cl. 241-172.000.
Takahashi, Yoshiharu: *See*—
Yoneyama, Saburo; Fujita, Masami; Ishii, Shizuo; Kichima, Mutsuhito; Takahashi, Yoshiharu; and Sameshima, Yoshinobu, 4,601,562, Cl. 354-170.000.
Takaishi, Naotake: *See*—
Fujikura, Yoshiaki; Takaishi, Naotake; and Inamoto, Yoshiaki, 4,602,107, Cl. 562-499.000.
Takano, Shoji; and Ide, Fumito, to Kabushiki Kaisha Toshiba. Document-scanning control apparatus for image-forming apparatus. 4,601,568, Cl. 355-8.000.
Takano, Tsutomu: *See*—
Tanino, Mikio; Tada, Eiji; and Takano, Tsutomu, 4,601,177, Cl. 62-149.000.
Takayanagi, Yoshiyuki; and Takeda, Masashi, to Sony Corporation. Integrated injection logic circuit. 4,602,244, Cl. 340-347.0DA.
Takeda Chemical Industries, Ltd.: *See*—
Meguro, Kanji; and Fujita, Takeshi, 4,602,027, Cl. 514-374.000.
Takeda, Masashi: *See*—
Takayanagi, Yoshiyuki; and Takeda, Masashi, 4,602,244, Cl. 340-347.0DA.
Takemae, Yoshihiro: *See*—
Nozaki, Shigeki; Takemae, Yoshihiro; and Enomoto, Seiji, 4,602,356, Cl. 365-230.000.
Takemori, Satoshi: *See*—
Sasaki, Kouji; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Takemori, Satoshi, 4,602,372, Cl. 372-58.000.
Takeshi, Tobe: *See*—
Hiroshi, Namikiri; Takeshi, Tobe; and Masahiko, Hattori, 4,602,086, Cl. 536-125.000.
Takeuchi, Hiroshi, to Kabushiki Kaisha Daikin Seisakusho. Dual action torsion damping device. 4,601,677, Cl. 464-68.000.
Takhtamirov, Evgeny P.: *See*—
Ryaboshtan, Jury S.; and Takhtamirov, Evgeny P., 4,602,215, Cl. 324-334.000.
Takumi, Kenta, to NEC Corporation. Systems for changing addresses of transmission apparatus. 4,602,366, Cl. 370-94.000.
Tam, Tim F.: *See*—
Krantz, Alexander; Tam, Tim F.; and Spencer, Robin W., 4,602,006, Cl. 514-63.000.
Tamai, Yasumasa: *See*—
Yada, Yoshio; Tamai, Yasumasa; and Iwama, Tsugio, 4,601,872, Cl. 376-248.000.
Tamaki, Hiroshi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Apparatus for measuring the characteristics of an optical system. 4,601,575, Cl. 356-124.000.
Tanahashi, Naokatsu: *See*—
Mizutani, Yutaka; Harata, Tatsuo; and Tanahashi, Naokatsu, 4,602,074, Cl. 526-245.000.
Tanaka, Kiyoshi: *See*—
Kaneko, Tetsuya; Saeki, Masaru; Tanaka, Kiyoshi; and Kawakita, Tetsuya, 4,601,829, Cl. 210-638.000.
Tanaka, Minoru: *See*—
Nishikawa, Makoto; and Tanaka, Minoru, 4,602,150, Cl. 235-382.000.
Tanaka, Mitsuo: *See*—
Takahashi, Michio; Tanaka, Mitsuo; Kanno, Fuchio; and Kobayashi, Kazuo, 4,601,963, Cl. 430-69.000.
Tanaka, Toshiki; Imoto, Katsuyuki; and Chinone, Naoki, to Hitachi, Ltd. Optical coupling system with intermediate coupling medium. 4,601,535, Cl. 350-96.200.
Tanaka, Yoichi: *See*—
Yasuda, Goichi; Noguchi, Rika; and Tanaka, Yoichi, 4,601,841, Cl. 252-62.900.
Tanaka, Yutaka: *See*—
Sakai, Masao; Sugimoto, Makoto; Hashizume, Miyakazu; Tanaka, Yutaka; and Ito, Yukihiko, 4,601,848, Cl. 252-503.000.
Tancredi, Henry J.: *See*—
Effron, Marc H.; and Tancredi, Henry J., 4,601,290, Cl. 128-305.000.
Tandem Group, Inc., The: *See*—
Bates, Norman H., 4,601,137, Cl. 52-63.000.
Taniguchi, Yutaka, to Fuji Photo Film Co., Ltd. Photodetector for generating position signals. 4,602,154, Cl. 250-227.000.
Tanino, Mikio; Tada, Eiji; and Takano, Tsutomu, to Nissan Motor Co., Ltd. Refrigerant over-charging checking system of closed circuit refrigeration air cooling system. 4,601,177, Cl. 62-149.000.
Tanizawa, Tetsu: *See*—
Aihara, Satoshi; and Tanizawa, Tetsu, 4,602,339, Cl. 364-490.000.
Tansil, Thomas B.: *See*—
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., 4,602,129, Cl. 179-18.00B.
Tasaka, Yasuo; Masuda, Sadao; and Sasaki, Kiyoshi, to Hitachi, Ltd. Method and apparatus for the temperature balancing control of a plurality of heat exchangers. 4,601,328, Cl. 165-12.000.
Taschner, Kenneth A.: *See*—
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de Hair, Johannes T. W.; van Kemenade, Johannes T. C.; and Berns, Everhardus G., 4,602,188, Cl. 313-487.000.
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Usher, Peter P.; and Gavaletz, Eugene J., to Metex Corporation. Squeak free seal for exhaust couplings. 4,601,476, Cl. 277-230.000.
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Giebel, Gerhard, 4,601,257, Cl. 118-411.000.
Usui, Fumio. Nozzle for coaters and applying filamentary material to a cylindrical core. 4,601,774, Cl. 156-433.000.
Utsugi, Mikio, to Fuji Photo Film Co., Ltd. Continuous photo mount. 4,601,573, Cl. 355-75.000.
Vadino, Winston A.: *See—*
Hanna, Gayda; and Vadino, Winston A., 4,601,894, Cl. 424-19.000.
Valcho, Joseph J.; Lindberg, Steven E.; Hunt, Mack W.; and Sabol, Albert R., to Amoco Corporation. Process for the preparation of overbased, molybdenum-alkaline earth metal sulfonate dispersions. 4,601,837, Cl. 252-40.700.
Valeo: *See—*
Despres, Dominique; and Feigler, Jacques, 4,601,373, Cl. 192-70.180.
Renaud, Pierre; and Lassiaz, Philippe, 4,601,379, Cl. 192-89.00B.
Valkenburg, Arie. Light reflecting safety belt. 4,601,538, Cl. 350-98.000.
Van Doorne's Transmissie B.V.: *See—*
van Deursen, Petrus H., 4,601,368, Cl. 192-3.300.
Vana Laerhoven, Willy: *See—*
Heeres, Jan; Backx, Leo; Vana Laerhoven, Willy; and Sturm, Elmar, 4,602,010, Cl. 514-184.000.
van Arragon, Gerrit W.: *See—*
Boute, Willem; Stoop, Guus; van Arragon, Gerrit W.; and Mensink, Kornelis A., 4,601,291, Cl. 128-419.0PT.
van Bogaert, Joseph R.: *See—*
Harter, David W.; and van Bogaert, Joseph R., 4,601,237, Cl. 99-349.000.
Vandenbossche, Claudine: *See—*
Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, 4,601,901, Cl. 424-61.000.
van der Velden, Hendricus J., to Stork Screens B.V. Printing sleeve. 4,601,928, Cl. 428-36.000.
van Deursen, Petrus H., to Van Doorne's Transmissie B.V. Infinitely variable ratio transmission. 4,601,368, Cl. 192-3.300.
van Doren, Hendrik D., to Thomassen & Drijver-Verblifa NV. Apparatus for feeding can bodies. 4,601,384, Cl. 198-481.100.
Van Dyke, James R. Door stop assembly. 4,601,502, Cl. 292-252.000.
van Kemenade, Johannes T. C.: *See—*
de Hair, Johannes T. W.; van Kemenade, Johannes T. C.; and Berns, Everhardus G., 4,602,188, Cl. 313-487.000.
van Overbruggen, Gerardus J. J., to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel. Electromagnetic metering device having asymmetrical levers. 4,601,411, Cl. 222-207.000.
Van Raaij, K. W. M. Unloading system for street sweeper. 4,601,631, Cl. 414-509.000.
van Rooden, Bernardus J. M. S.; and Martinez, Jose L. T., to Dow Chemical Company, The. Polymeric compositions useful as binders in coating colors and coating colors prepared therefrom. 4,602,059, Cl. 524-521.000.
Vari-Lite, Inc.: *See—*
Bornhorst, James M., 4,602,321, Cl. 362-268.000.
Varian Associates, Inc.: *See—*
Kessler, Sebastian W., Jr.; and Lavering, Gordon R., 4,601,331, Cl. 165-104.330.
Kneip, George D., Jr.; Broshear, John H.; and Anderson, Marvin H., 4,601,175, Cl. 62-50.000.
Lint, James D., 4,602,122, Cl. 174-52.00R.
Vatis, Dimitrios, to General Electric Company. Apparatus for the gated modulation of a radio-frequency carrier signal. 4,602,226, Cl. 332-31.00R.
Veb Chemieanlagenbaukombinat Leipzig-Grimma: *See—*
Dreyer, Siegfried, 4,601,824, Cl. 210-232.000.
VEB Werk fuer Fernsehelektronik im VED Kombinat Mikroelektronik: *See—*
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; Enzenberg, Hartmut; and Isenberg, Andreas, 4,601,846, Cl. 252-299.100.
Veenman, Simon J. M.; and Benraad, Coenraad J. B. M., to Veenman, Simon J. M. Stackable carrier or crate for goods or articles. 4,601,393, Cl. 206-505.000.
Verdelet, Alain B. A., to Masoneilan International Inc. Improved butterfly valve. 4,601,459, Cl. 251-306.000.
Verdi, Anthony J., to Ketcham & McDougall, Inc. Electric pencil sharpener. 4,601,316, Cl. 144-28.720.
Verdier, Jean-Michel: *See—*
Jacubert, Serge; Grosbois, Jean; and Verdier, Jean-Michel, 4,601,798, Cl. 204-61.000.
Vermeulen-Hollandia Octrooien II B.V.: *See—*
Boots, Robert T., 4,601,512, Cl. 296-221.000.
Vetco Offshore, Inc.: *See—*
Bell, James L., Jr.; Thatcher, Mark T.; Phillips, Brian K.; Brammer, Norman; and Sweeney, Thomas F., 4,601,491, Cl. 285-24.000.
Victaulic Company of America: *See—*
Webb, Maurice J., 4,601,495, Cl. 285-112.000.
Victor Company of Japan, Limited: *See—*
Kumaki, Takashi; and Saito, Takashi, 4,602,361, Cl. 369-77.200.
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,602,300, Cl. 360-60.000.
Vidra, James D.: *See—*
Stier, Roger E.; Dunn, William H.; and Vidra, James D., 4,601,898, Cl. 424-52.000.
Stier, Roger E.; Dunn, William H.; and Vidra, James D., 4,601,899, Cl. 424-52.000.
Viel, Vincenzo: *See—*
Tabacchi, Vittorio; and Viel, Vincenzo, 4,601,555, Cl. 351-90.000.
Vieth, Wolf R.; Wang, Shaw S.; and Gilbert, Seymour G., to Research Corporation. Enzymatically active protein-enzyme complex membranes. 4,601,981, Cl. 435-94.000.
Vilmur, Richard J.; and D'Avello, Robert F., to Motorola, Inc. Automatic output control circuitry for RF power amplifiers with wide dynamic range. 4,602,218, Cl. 330-279.000.
Vinches, Gerard; and Fiquet, Line L., to Witco Chemical Corporation. Urethane elastomers prepared using a prepolymer prepared from a polyester which reacts with a chain-extending agent and/or a saturated polyester resin in which at least one of the polyesters is prepared from a dimer and/or trimer fatty acid. 4,602,079, Cl. 528-60.000.
Vire , Sylvestre, to Swiss Aluminium Ltd. Cell for electrolytic purification of aluminum. 4,601,804, Cl. 204-244.000.
Vitafin N.V.: *See—*
Boute, Willem; Stoop, Guus; van Arragon, Gerrit W.; and Mensink, Kornelis A., 4,601,291, Cl. 128-419.0PT.
Vitronics Corporation: *See—*
Furtek, Edward J., 4,602,238, Cl. 338-236.000.
Vivat, Michel: *See—*
Buendia, Jean; and Vivat, Michel, 4,601,854, Cl. 260-239.500.
VMX, Inc.: *See—*
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., 4,602,129, Cl. 179-18.00B.
Vogel, Alan D., to PACE Incorporated. Temperature controlled solder extractor electrically heated tip assembly. 4,602,144, Cl. 219-230.000.
Von Duprin, Inc.: *See—*
Kim, Kun H., 4,601,499, Cl. 292-36.000.
Von Bargen, Kenneth P.; and Taschner, Kenneth A., to Pacific Scientific Company. Analog-to-digital conversion and averaging system for an optical analyzing instrument. 4,602,243, Cl. 340-347.0AD.
Vongeheur, Hermann-Otto, to Winkler+Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Apparatus for pouring confectionery solution. 4,601,651, Cl. 425-143.000.
Vosburgh, Mark G.: *See—*
Berg, Lloyd; and Vosburgh, Mark G., 4,601,791, Cl. 203-51.000.
Vreenegoor, Nicholas C., to Unifoam AG. Method and apparatus for the production of polymeric foam. 4,601,864, Cl. 264-37.000.
Vulcan-Hart Corporation: *See—*
Harter, David W.; and van Bogaert, Joseph R., 4,601,237, Cl. 99-349.000.
W. R. Grace & Co., Cryovac Div.: *See—*
Mugnai, Giorgio, 4,601,159, Cl. 53-511.000.
Wachtel, Anselm: *See—*
Gottlieb, Milton; and Wachtel, Anselm, 4,602,342, Cl. 364-498.000.
Wada, Masami: *See—*
Konotsune, Shiro; Higashi, Hiromi; Wada, Masami; Maehara, Hiroshi; and Tsuji, Kazuyuki, 4,602,065, Cl. 525-326.500.
Wade, Philip J.: *See—*
Clark, John R. G.; and Wade, Philip J., 4,601,604, Cl. 404-69.000.
Wadsworth, Gerald J.: *See—*
Ashbury, Thomas W.; and Wadsworth, Gerald J., 4,601,711, Cl. 604-224.000.
Wagenknecht, John H., to Monsanto Company. Electrochemical carboxylation of p-isobutylacetophenone and other aryl ketones. 4,601,797, Cl. 204-59.00R.
Wagner, Terrence L.: *See—*
Kammann, Karl P., Jr.; and Wagner, Terrence L., 4,601,838, Cl. 252-49.300.
Wakefield, G. Felix; and Yoo, Hyouk I., to Atlantic Richfield Company. Solar cell manufacture. 4,602,120, Cl. 136-256.000.
Wald, Stephen L.: *See—*
Bogle, Robert W.; Gero, Gary; and Wald, Stephen L., 4,601,557, Cl. 352-140.000.
Walder, Andre : *See—*
Marty, Michel; Octor, Henri; and Walder, Andre , 4,601,874, Cl. 419-23.000.
Walinsky, Stanley W.: *See—*
Stong, Randel E.; and Walinsky, Stanley W., 4,602,067, Cl. 525-327.400.
Walker, Loren H., to General Electric Company. Control for induction motor drive using load commutated inverter circuit. 4,602,199, Cl. 318-798.000.
Walker, Loren H., to General Electric Company. Alternating current motor drive having current filter. 4,602,200, Cl. 318-798.000.

Walker, Loren H., to General Electric Company. Capacitance control for a static var generator. 4,602,206, Cl. 323-211.000.

Walker, Loren H.: *See—*
Weiss, Herbert W.; and Walker, Loren H., 4,602,198, Cl. 318-798.000.

Wallace, John. Fastener system and method. 4,601,623, Cl. 411-336.000.

Wallace, Leslie E.; Rokosz, Leo F.; and Stacy, Charles L., Jr., to Dow Chemical Company, The. Color improvement of polymer compounds and products molded therefrom. 4,602,072, Cl. 526-77.000.

Wallace, Robert S.: *See—*
DeWolf, Lowell E.; Scrudato, James J.; and Wallace, Robert S., 4,601,584, Cl. 368-10.000.

Walpat AG: *See—*
Langenhorst, Christoph, 4,601,189, Cl. 72-326.000.

Walton, Otis R.: *See—*
Lewis, Arthur E.; Braun, Robert L.; Mallon, Richard G.; and Walton, Otis R., 4,601,811, Cl. 208-410.000.

Wang, Kun-Meng. Line extender and rewinder for kite. 4,601,440, Cl. 242-96.000.

Wang, Shaw S.: *See—*
Vieth, Wolf R.; Wang, Shaw S.; and Gilbert, Seymour G., 4,601,981, Cl. 435-94.000.

Waniczek, Helmut; Hohmann, Gerhard; Bartl, Herbert; and Mott, Ludwig, to Bayer Aktiengesellschaft. Use of grafted ethylene-vinylacetate copolymers for the production of hotmelt adhesives. 4,602,056, Cl. 524-272.000.

Waring, Alan J.: *See—*
Campbell, Colin T.; Clements, Richard J.; Robinson, John F.; and Waring, Alan J., 4,601,610, Cl. 405-188.000.

Warner, Isiah M.: *See—*
Patonay, Gabor; Warner, Isiah M.; and Oldham, Philip B., 4,602,193, Cl. 315-170.000.

Warner-Lambert Company: *See—*
Belsole, Susan C., 4,602,040, Cl. 514-567.000.
Kiely, John S.; and Huang, Suchin, 4,602,023, Cl. 514-346.000.
Knebl, Leslie F.; and Lewis, Ramola, 4,601,907, Cl. 426-5.000.
Sircar, Ila; and Bristol, James A., 4,602,019, Cl. 514-248.000.

Warner & Swasey Company, The: *See—*
Myers, Carl J., 4,601,094, Cl. 29-568.000.

Watanabe, Hiroshi, to NEC Corporation. Memory circuit with noise preventing means for word lines. 4,602,355, Cl. 365-206.000.

Watanabe, Jusuke, to Watanabe Pipe Co., Ltd. Semicircular arching roof type pipe-frame greenhouse with monitor roof-like protrusion. 4,601,136, Cl. 52-63.000.

Watanabe Pipe Co., Ltd.: *See—*
Watanabe, Jusuke, 4,601,136, Cl. 52-63.000.

Watanabe, Shoyu: *See—*
Toriu, Jirou; Yamamoto, Hiroshi; and Watanabe, Shoyu, 4,602,307, Cl. 360-125.000.

Watanabe, Tomoyuki: *See—*
Tokoro, Setsuo; Watanabe, Tomoyuki; and Shigematsu, Takashi, 4,601,680, Cl. 474-11.000.

Watanabe, Yasuo; Takahashi, Takeo; and Haga, Keiji, to Fuji Electric Company, Ltd. Traveling magnetic field type crusher. 4,601,431, Cl. 241-172.000.

Watanabe, Yoshiaki, to Canon Kabushiki Kaisha. Lens moving device using piezoelectric material. 4,601,539, Cl. 350-255.000.

Watson, Norman F., to Ferranti plc. Accelerometer system. 4,601,206, Cl. 73-514.000.

Watson, Robert E.: *See—*
Starnes, Dennis L.; Kimball, William G.; and Watson, Robert E., 4,601,225, Cl. 83-175.000.

Wawersig, Jurgen; and Kantz, Dieter, to Siemens Aktiengesellschaft. Integrated semiconductor circuit with a dynamic read-write memory. 4,602,353, Cl. 365-189.000.

Weatherford/Lamb, Inc.: *See—*
Lovegrove, Peter J., 4,601,334, Cl. 166-241.000.

Webb, Maurice J., to Victaulic Company of America. Pipeline system and method of assembly. 4,601,495, Cl. 285-112.000.

Weber, Kenneth E.; and Oberlin, Dirk, to Amoco Corporation. Rubber composition and method of incorporating carbon black and a quaternary ammonium coupling agent salt into natural rubber containing compositions. 4,602,052, Cl. 523-215.000.

Weber, Kurt: *See—*
Luthi, Christian; Meyer, Hans R.; and Weber, Kurt, 4,602,087, Cl. 544-78.000.

Webers, Vincent J.: *See—*
Cohen, Abraham B.; and Webers, Vincent J., 4,601,970, Cl. 430-258.000.

Webster, Charles G.; Smith, John S.; and Campbell, Frank, Jr., to Cameron Iron Works, Inc. Skid rail. 4,601,659, Cl. 432-234.000.

Webster, Milo E., to Allied Corporation. Liquid handling system. 4,601,881, Cl. 422-67.000.

Webster, Richard T., to United States of America, Air Force. X33 cut quartz for temperature compensated SAW devices. 4,602,182, Cl. 310-313.00A.

Wedertz, Larry D.: *See—*
Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., 4,601,493, Cl. 285-53.000.

Wegner, Eugene H.; and Shay, Lucas K., to Phillips Petroleum Company. Protein product of reduced nucleic acid content and low allergenicity. 4,601,986, Cl. 435-255.000.

Wehr Corporation: *See—*
Hendricks, Wayne D., 4,601,371, Cl. 192-52.000.

Weidenhaupt, Wolfgang; Wepner, Gunter; and Dismon, Peter, to Akzo NV. Method of manufacturing a compact, multilayer single strand reinforcing cord for use in elastomeric products and a cord produced by this method. 4,601,165, Cl. 57-213.000.

Weigel, Wolfgang: *See—*
Karning, Heinrich; Raubinger, Gerhard; and Weigel, Wolfgang, 4,601,540, Cl. 350-266.000.

Weigl, William: *See—*
Stottmann, Richard L.; Ponikwia, Edward F.; and Weigl, William, 4,601,429, Cl. 241-92.000.

Weinand, Louis H., to General Motors Corporation. Fuel rail. 4,601,275, Cl. 123-468.000.

Weingarten, Gordon G., to Glaxo Group Limited. Cephalosporin antibiotics. 4,602,012, Cl. 514-202.000.

Weismann, Peter H.; Cameron, Dugald; and Eastman, Richard E., to Chrysler Corporation. Part time on-demand four-wheel drive vehicle transaxle with viscous clutch. 4,601,359, Cl. 180-233.000.

Weiss, Franz-Josef; Habermann, Wolfgang; Hammes, Peter; Ritz, Josef; Thomas, Erwin; and Thoma, Peter, to BASF Aktiengesellschaft. Preparation of aqueous solutions of hydroxylammonium carbonate. 4,601,800, Cl. 204-182.400.

Weiss, Herbert W.; and Walker, Loren H., to General Electric Company. Induction motor drive using load commutated inverter circuit. 4,602,198, Cl. 318-798.000.

Weiss, Ladislaus: *See—*
Martell, William A.; and Weiss, Ladislaus, 4,601,867, Cl. 264-227.000.

Welch, Montgomery J.; Mitchell, Terry; and Hodge, David H., to Modular Systems, Inc. Resilient fastener clip and joint therefor. 4,601,247, Cl. 108-152.000.

Welch, William D., Jr.: *See—*
Atkinson, Roger F.; Dennison, Steven C.; Welch, William D., Jr.; and Jolly, Ronald L., 4,602,134, Cl. 179-175.10R.

Wellform Engineering Company (Sussex) Limited, The: *See—*
Johnson, Frank; and Akehurst, Sidney D., 4,601,187, Cl. 72-64.000.

Wellner, Wolfgang; Pedain, Josef; and Gruber, Hermann, to Bayer Aktiengesellschaft. Process for the production of oligourethanes containing mercapto groups and their use as binders for coating and sealing compositions hardenable by oxidation and as additives for epoxide resins. 4,602,071, Cl. 525-528.000.

Wells, Larry; Gale, Nigel; and Baugh, J. Dan, to Cummins Engine Company, Inc. Internal combustion engine with improved coolant arrangement. 4,601,265, Cl. 123-41.280.

Welsch, Bertram; and Blauw, Gunther, to Alwin Welsch Polstermobelfabrik KG; and Erpo Mobelerke W. Blauw GmbH & Co. Furniture, particularly upholstered furniture, for transferring from a sitting position to a lying position. 4,601,074, Cl. 5-47.000.

Wenzlick, Erich; and Rothfuss, Hermann, to BBP-Kunststoffwerk Marbach Baier GmbH und Co. KG. Drawer for furniture. 4,601,523, Cl. 312-330.00R.

Wepner, Gunter: *See—*
Weidenhaupt, Wolfgang; Wepner, Gunter; and Dismon, Peter, 4,601,165, Cl. 57-213.000.

Wesley, James G., to Labelette Company. Labeling machine attachment for applying pressure sensitive labels to round containers. 4,601,771, Cl. 156-215.000.

Wessel, Ulrich, to Klockner-Humboldt-Deutz AG - Zweigniederlassung Fahr. Rotary mowing attachment for a tractor and the like. 4,601,162, Cl. 56-13.600.

West, Jack E.: *See—*
Pierce, William C.; and West, Jack E., 4,601,378, Cl. 192-115.000.

West, Michael H.; and Nagel, Fritz J., to Chapman Chemical Company. Antimicrobial compositions and methods of using same. 4,602,011, Cl. 514-187.000.

West, Robert C.; and Djurovich, Peter I., to Wisconsin Alumni Research Foundation. Method for cross-linking organopolysilane polymers. 4,602,050, Cl. 522-135.000.

West, Roger A.; Humphrey, Dallas R; Bergquist, Carl R.; and DeGree, David C., to Bergquist Company, The. Mounting pad with tubular projections for solid-state devices. 4,602,125, Cl. 174-138.00G.

Westendorf Manufacturing Company, Inc.: *See—*
Langenfeld, Joseph W.; and Westendorf, Neal W., 4,601,634, Cl. 414-697.000.

Westendorf, Neal W.: *See—*
Langenfeld, Joseph W.; and Westendorf, Neal W., 4,601,634, Cl. 414-697.000.

Westermann, Jurgen; Boroschewski, Gerhard; Eder, Ulrich; Arndt, Friedrich; Krahmer, Hansjorg; and Kotter, Clemens, to Schering Aktiengesellschaft. Substituted sulfonylurea, processes for the production of these compounds, as well as compositions containing the same and having herbicidal and plant growth regulating activity. 4,601,746, Cl. 71-92.000.

Westinghouse Electric Corp.: *See—*
Choby, Edward J., 4,601,223, Cl. 82-82.000.
Draper, Robert; and Wolfe, Robert W., 4,601,113, Cl. 34-10.000.
Draper, Robert; and Wolfe, Robert W., 4,601,115, Cl. 34-32.000.
Eckels, Phillip W.; and Heberlein, Joachim V. R., 4,602,177, Cl. 310-57.000.
Edwards, Charles W., 4,602,201, Cl. 318-811.000.
Gottlieb, Milton; and Wachtel, Anselm, 4,602,342, Cl. 364-498.000.
Harter, Mark A.; and Schoumaker, Raoul J. P., 4,601,146, Cl. 52-239.000.
Kalkbrenner, Ralph W.; and Leumann, Hans E., 4,601,221, Cl. 81-418.000.
Kuznetsov, Stephen B.; and Kilgore, Lee A., 4,602,179, Cl. 310-178.000.
Sharbaugh, John E., 4,601,449, Cl. 248-58.000.
Zussman, Melvin P., 4,601,944, Cl. 428-251.000.

Westley, John: *See—*
Liu, Chao-Min; Tresner, Homer D.; and Westley, John, 4,601,984, Cl. 435-119.000.
Weyerhaeuser Company: *See—*
Gallaher, Donald D., 4,601,687, Cl. 493-89.000.
Whang, Keh-Wen: *See—*
Perkins, William C.; and Whang, Keh-Wen, 4,602,240, Cl. 340-310.00R.
Whealton, John H.; and Stirling, William L., to United States of America, Energy. Negative ion source with low temperature transverse divergence optical system. 4,602,161, Cl. 250-423.00R.
Whistler, Wayne J., to Perkin-Elmer Corporation, The. Multi-port valve in a gas collection system and method of using same. 4,601,211, Cl. 73-863.330.
Whitchurch, Patricia A. Arm sling device. 4,601,285, Cl. 128-94.000.
White, Robert J.; and Roberts, Ross E., to Prime Computer, Inc. Multi-token, multi-channel single bus network. 4,602,365, Cl. 370-89.000.
White, William J.; Ortolf, James M.; and Gordon, William R., to Honeywell Inc. Integrated circuit chip carrier. 4,601,526, Cl. 339-17.0CF.
Wicks, Jerome L., Sr. Door security device. 4,601,503, Cl. 292-259.00R.
Wider, Hans W., to C. A. Weidmueller GmbH & Co. Electrical connector for large-current circuits. 4,601,531, Cl. 339-272.00R.
Wieland-Werke AG: *See—*
Durrschnabel, Wolfgang; Stuer, Heinrich; Steeb, Jorg; and Puckert, Franz J., 4,601,879, Cl. 420-473.000.
Wilcox, Roger. Adjustable room partition. 4,601,145, Cl. 52-238.100.
Wild, Georg: *See—*
Mayer, Harald; and Wild, Georg, 4,601,180, Cl. 66-121.000.
Wilding, Oliver K., Jr.: *See—*
Halm, Roland L.; Wilding, Oliver K., Jr.; and Zapp, Regie H., 4,602,101, Cl. 556-472.000.
Wilhite, John E.: *See—*
Circello, Joseph C.; Wilhite, John E.; Shelly, William A.; and Riley, Morgan S., 4,602,368, Cl. 371-21.000.
Wilkinson Sword Limited: *See—*
Althaus, Wolfgang, 4,601,392, Cl. 206-349.000.
McGready, Angus J., 4,601,101, Cl. 30-40.200.
Williams, Barry W.; and Palmer, Patrick R. Switch-off circuits for transistors and gate turn-off thyristors. 4,602,209, Cl. 323-351.000.
Williams, John P., Jr.: *See—*
Hutton, Roger L.; and Williams, John P., Jr., 4,602,139, Cl. 219-10.430.
Williams, Laurens R., II: *See—*
Fukui, George M.; Spencer, Herbert J.; and Williams, Laurens R., II, 4,602,007, Cl. 514-159.000.
Williams, Robert A. Armored cables and fittings for test probes. 4,602,123, Cl. 174-72.00R.
Williams, Sharon L. Hand puppet. 4,601,670, Cl. 446-327.000.
Willis, Donald H.: *See—*
Fling, Russell T.; Willis, Donald H.; and McNeely, David L., 4,602,276, Cl. 358-27.000.
Willms, Lothar; Mildenberger, Hilmar; Baur, Klaus; Burstell, Helmut; and Bieringer, Hermann, to Hoechst Aktiengesellschaft. N-alkoxyaminosulfonylureas and N-alkylsulfonylaminosulfonylureas and pyrimidino thiadiazine oxides as herbicides and plant growth-regulators. 4,601,747, Cl. 71-92.000.
Willson, Carlton G.: *See—*
Clecak, Nicholas J.; Grant, Barbara D.; Miller, Robert D.; Tompkins, Terry C.; and Willson, Carlton G., 4,601,969, Cl. 430-192.000.
Wilson Greatbatch Ltd.: *See—*
Zayatz, Robert A., 4,601,962, Cl. 429-211.000.
Wilson, Randall B.: *See—*
Besomi, Paul R.; Nelson, Ronald J.; and Wilson, Randall B., 4,601,888, Cl. 422-253.000.
Wilson, Roland B. Ice block making and storage system. 4,601,174, Cl. 62-66.000.
Windmoller & Holscher: *See—*
Upmeier, Hartmut, 4,601,649, Cl. 425-72.00R.
Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG: *See—*
Blumle, Martin, 4,601,388, Cl. 198-726.000.
Winkler+Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG: *See—*
Vongeheur, Hermann-Otto, 4,601,651, Cl. 425-143.000.
Wirt, James R.: *See—*
Shelby, Billy L.; and Wirt, James R., 4,602,236, Cl. 336-216.000.
Wirz, Peter, to Zapfe, Hans. Magnetron cathode for sputtering ferromagnetic targets. 4,601,806, Cl. 204-298.000.
Wisconsin Alumni Research Foundation: *See—*
West, Robert C.; and Djurovich, Peter I., 4,602,050, Cl. 522-135.000.
Wise, David S., to McGraw-Hill, Inc. Microfilming system with zone controlled adaptive lighting. 4,601,572, Cl. 355-68.000.
Wisseroth, Karl, to BASF Aktiengesellschaft. Arrangement for orienting rockets moving in liquids. 4,601,251, Cl. 114-23.000.
Witco Chemical Corporation: *See—*
Vinches, Gerard; and Fiquet, Line L., 4,602,079, Cl. 528-60.000.
Wittman, Leroy L.; and Olsen, David W., to FMC Corporation. Centering arrangement for redecking of crane upper. 4,601,401, Cl. 212-180.000.
Witzel, Ted, to Onward Hardware Limited. Fireplace insert. 4,601,280, Cl. 126-121.000.
WOCO Franz-Josef Wolf & Co.: *See—*
Wolf, Franz J.; and Pletsch, Hubert, 4,601,678, Cl. 464-83.000.
Wohltman, Keith W.: *See—*
Chou, Mau-Song; and Wohltman, Keith W., 4,602,118, Cl. 568-570.000.
Wolf, Chitis, to Fondedile S.p.A. Method for making a concrete or similar pillar on site, and resulting pillar. 4,601,613, Cl. 405-239.000.
Wolf, Franz J.; and Pletsch, Hubert, to WOCO Franz-Josef Wolf & Co. Torsionally resilient coupling with a connecting element. 4,601,678, Cl. 464-83.000.
Wolf, Ralph C., to Major Lock, Corp. Safety mechanism for high security lock. 4,601,504, Cl. 292-334.000.
Wolfe, Robert W.: *See—*
Draper, Robert; and Wolfe, Robert W., 4,601,113, Cl. 34-10.000.
Draper, Robert; and Wolfe, Robert W., 4,601,115, Cl. 34-32.000.
Wolfram, Leszek J.; and Albrecht, Linda, to Clairol Incorporated. Hair setting process and tissue. 4,601,299, Cl. 132-7.000.
Wolter, Manfred: *See—*
Dorn, Friedrich-Wilhelm; Wolter, Manfred; and Heymer, Gero, 4,601,887, Cl. 422-150.000.
Wong, Patrick S. L.; Langston, Jimmy B.; and Leeper, Harold M., to ALZA Corporation. Urine container with biocidal activity. 4,601,880, Cl. 422-28.000.
Wood, Garfield A., Jr. Air exhaust by-pass for underwater exhaust systems. 4,601,666, Cl. 440-89.000.
Woolford, Murray W.: *See—*
Woolhouse, James K.; and Woolford, Murray W., 4,601,578, Cl. 356-338.000.
Woolhouse, James K.; and Woolford, Murray W. Measurement of sperm motility. 4,601,578, Cl. 356-338.000.
Worldwide Converting Machinery, Inc.: *See—*
Krimsky, Leonard C., 4,601,116, Cl. 34-156.000.
Wren, John P., to Garrard Products Limited. Device for damping an oscillatory system. 4,601,362, Cl. 181-208.000.
Wright, E. Scott, to Garrett Corporation, The. Elastomeric bearing damper apparatus and associated methods. 4,601,591, Cl. 384-536.000.
Wright, John F.: *See—*
Grashof, Hans R.; Kan, Hsin-Chia; Sandhu, M. Akram; Wright, John F.; and Yacobucci, Paul D., 4,601,966, Cl. 430-109.000.
Wu, Mu T.: *See—*
Patchett, Arthur A.; and Wu, Mu T., 4,602,002, Cl. 514-11.000.
Wuttudal, Hermann. Turret for mooring VLCC size vessels. 4,601,252, Cl. 114-230.000.
Wynn, Stephen R., to General Electric Company. Circuit for band-switching a voltage controlled oscillator. 4,602,222, Cl. 331-179.000.
Xebec: *See—*
Mattson, Gary L., 4,602,197, Cl. 318-696.000.
Xerox Corporation: *See—*
Hawkins, William G.; Drake, Donald J.; and Campanelli, Michael R., 4,601,777, Cl. 156-626.000.
Hueber, Mark A., 4,601,394, Cl. 209-3.300.
Permoda, Ronald L., 4,601,621, Cl. 411-182.000.
Temes, Gabor C., 4,602,291, Cl. 358-221.000.
Yacisin, Paul: *See—*
Barish, Ken; and Yacisin, Paul, 4,601,616, Cl. 405-288.000.
Yacobucci, Paul D.: *See—*
Grashof, Hans R.; Kan, Hsin-Chia; Sandhu, M. Akram; Wright, John F.; and Yacobucci, Paul D., 4,601,966, Cl. 430-109.000.
Yada, Yoshio; Tamai, Yasumasa; and Iwama, Tsugio, to Hitachi, Ltd. Water sealing device for use in replacing control rod drive housing. 4,601,872, Cl. 376-248.000.
Yaeshima, Tomoko: *See—*
Okonogi, Shigeo; Ono, Jyoji; Kudo, Tsutomu; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,601,985, Cl. 435-253.000.
Yagi Antenna Co., Ltd.: *See—*
Nakata, Yukio; and Suda, Kaoru, 4,602,252, Cl. 340-825.500.
Yale University: *See—*
Gershoni, Jonathan M., 4,601,828, Cl. 210-635.000.
Yamada, Jun, to Hitachi, Ltd. Surface acoustic wave filter. 4,602,228, Cl. 333-194.000.
Yamada, Katsuhiko: *See—*
Tsuda, Tetsuaki; Asano, Kazuo; Shibuya, Atsuyoshi; Nishihara, Minoru; Yanagi, Kenichi; Kato, Mitsuo; Yamada, Katsuhiko; and Fujisaka, Teijiro, 4,601,794, Cl. 204-15.000.
Yamada, Kazumori; and Akahori, Masaaki, to NEC Corporation. Paging receiver which is resettable with external-noise detector. 4,602,254, Cl. 340-825.480.
Yamada, Kenzo; Iwasaki, Katsuhiro; Ohtsuki, Mitsuru; and Ito, Haruo, to Nippon Kokan Kabushiki Kaisha. Method for adjusting chemical composition of molten pig iron tapped from blast furnace. 4,601,749, Cl. 75-53.000.
Yamada, Mitsuhiko, to Dainippon Screen Mfg. Co., Ltd. Image reproducing method having a retouching function and an apparatus embodying the same. 4,602,294, Cl. 358-280.000.
Yamaguchi, Nobutaka: *See—*
Iida, Shinobu; Yamaguchi, Nobutaka; Tsukuda, Fumiaki; Fujiyama, Masaaki; and Tadokoro, Eiichi, 4,601,946, Cl. 428-323.000.
Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Lens barrel having motor. 4,601,564, Cl. 354-271.100.
Yamamoto, Hiroshi: *See—*
Toriu, Jirou; Yamamoto, Hiroshi; and Watanabe, Shoyu, 4,602,307, Cl. 360-125.000.
Yamamoto, Hitoshi; Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, to Sumitomo Special Metals Co., Ltd. Process for producing magnetic materials. 4,601,875, Cl. 419-23.000.
Yamamoto, Katsusaku: *See—*
Arii, Seiji; and Yamamoto, Katsusaku, 4,601,590, Cl. 384-99.000.

Yamamoto, Shinji; Kaijiri, Kohei; and Nagakura, Koichi, to Ube Industries, Ltd. Production of reinforced rubber composition. 4,602,063, Cl. 525-127.000.
Yamanaka, Motosuke; Saito, Isao; Yamatsu, Kiyomi; and Fujimoto, Takako, to Eisai Co., Ltd. Anti-depressant imidazoles, compositions and use. 4,602,031, Cl. 514-399.000.
Yamane, Satoshi; and Suzuki, Toshitatsu, to Ricoh Company, Ltd. Distance measuring apparatus. 4,601,574, Cl. 356-1.000.
Yamanoue, Kouichi: *See*—
Kitagawa, Junji; Akita, Shigeyuki; and Yamanoue, Kouichi, 4,602,255, Cl. 340-825.690.
Yamashita, Keitaro, to Kentek Information Systems, Inc. Developing apparatus. 4,601,259, Cl. 118-658.000.
Yamashita, Michio; and Fujimura, Setsuo, to Sumitomo Special Metals Co., Ltd. Sintered Fe-Cr-Co type magnetic alloy and method for producing article made thereof. 4,601,876, Cl. 419-23.000.
Yamashita, Yoshimi, to Fuji Photo Film Co., Ltd. Automatic housing type electronic flashlight device of a folding type camera. 4,601,561, Cl. 354-149.110.
Yamatsu, Kiyomi: *See*—
Yamanaka, Motosuke; Saito, Isao; Yamatsu, Kiyomi; and Fujimoto, Takako, 4,602,031, Cl. 514-399.000.
Yamauchi, Manabu: *See*—
Hayashi, Tsuneyuki; Yamauchi, Manabu; Tago, Kazuhide; Konishi, Toshio; and Hirai, Shinji, 4,601,433, Cl. 242-4.00R.
Yamazaki, Katsunori: *See*—
Yamazaki, Kichisaburo; Yamazaki, Katsunori; and Yamazaki, Yoshihiro, 4,601,105, Cl. 33-180.0AT.
Yamazaki, Kichisaburo; Yamazaki, Katsunori; and Yamazaki, Yoshihiro. Vehicle measuring instrument. 4,601,105, Cl. 33-180.0AT.
Yamazaki, Yoshihiro: *See*—
Yamazaki, Kichisaburo; Yamazaki, Katsunori; and Yamazaki, Yoshihiro, 4,601,105, Cl. 33-180.0AT.
Yanagi, Kenichi: *See*—
Tsuda, Tetsuaki; Asano, Kazuo; Shibuya, Atsuyoshi; Nishihara, Minoru; Yanagi, Kenichi; Kato, Mitsuo; Yamada, Katsuhiko; and Fujisaka, Teijiro, 4,601,794, Cl. 204-15.000.
Yanagishima, Takayuki: *See*—
Seko, Yasutoshi; Iizuka, Haruhiko; Yanagishima, Takayuki; and Obara, Hideo, 4,602,247, Cl. 340-575.000.
Yang, Ta-Lun; and Broome, Paul, to Ensco, Inc. General purpose modular acoustic signal generator. 4,602,245, Cl. 340-384.00R.
Yang, Ta-Lun; and Broome, Paul, to Ensco Inc. Coded acoustic alarm transmitter/receiver system. 4,602,357, Cl. 367-93.000.
Yano, Osahiko: *See*—
Nishitani, Yasuo; and Yano, Osahiko, 4,602,298, Cl. 360-14.100.
Yasuda, Goichi; Noguchi, Rika; and Tanaka, Yoichi, to TDK Corporation. Ferroelectric ceramic composition. 4,601,841, Cl. 252-62.900.
Yasui, Takashi: *See*—
Hatsutta, Susumu; and Yasui, Takashi, 4,601,515, Cl. 297-361.000.
Yata, Shizukuni, to Kanebo, Ltd. Electrically conductive organic polymeric material and process for production thereof. 4,601,849, Cl. 252-500.000.
Yeakey, Ernest L.; and Sanderson, John R., to Texaco Inc. Production of alkyl glycolates. 4,602,102, Cl. 560-179.000.
Yeda Research and Development Co., Ltd.: *See*—
Yerushalmi, Aharon, 4,601,296, Cl. 128-804.000.
Yen, Jeffrey H.: *See*—
Chu, Pochen; and Yen, Jeffrey H., 4,601,993, Cl. 502-66.000.
Yen, Jing G.; and Popelka, David A., to Bell Helicopter Textron Inc. Nodalized rotor. 4,601,639, Cl. 416-230.000.
Yerushalmi, Aharon, to Yeda Research and Development Co., Ltd. Hyperthermia apparatus. 4,601,296, Cl. 128-804.000.
Yester, Francis R., Jr.; and Gannon, Mark A., to Motorola, Inc. Resonant bandpass T filter and power splitter. 4,602,229, Cl. 333-208.000.
Yokley, John M.: *See*—
Lindsey, Hiram E., Jr.; Allwin, Roger P.; and Yokley, John M., 4,601,343, Cl. 166-382.000.
Yokoyama, Naokata, to Ciba-Geigy Corporation. Ring-fused pyrazolo[3,4-d]-pyridin-3-one derivatives as benzodiazepine receptor modulators. 4,602,014, Cl. 514-215.000.
Yokoyama, Shigeyoshi, to Hitachi, Ltd. Method and system for controlling industrial robot. 4,602,345, Cl. 364-513.000.
Yoneyama, Saburo; Fujita, Masami; Ishii, Shizuo; Kichima, Mutsuhito; Takahashi, Yoshiharu; and Sameshima, Yoshinobu, to Konishiroku Photo Industry Co., Ltd. Camera. 4,601,562, Cl. 354-170.000.
Yoo, Hyouk I.: *See*—
Wakefield, G. Felix; and Yoo, Hyouk I., 4,602,120, Cl. 136-256.000.
York, James A. Hunting seat. 4,601,364, Cl. 182-187.000.
Yoshida, Hiroshi; and Tsubokawa, Yoshitoki, to Yoshida Kogyo K. K. Water-resistant slide fastener stringer. 4,601,085, Cl. 24-384.000.
Yoshida, Hiroshi: *See*—
Kozuka, Hajime; and Yoshida, Hiroshi, 4,601,358, Cl. 180-141.000.
Yoshida Kogyo K. K.: *See*—
Yoshida, Hiroshi; and Tsubokawa, Yoshitoki, 4,601,085, Cl. 24-384.000.
Yoshida, Yasutomo. Scale balancing device in universal parallel ruler device. 4,601,107, Cl. 33-438.000.
Yoshikawa, Osamu, to Shimano Industrial Company Limited. Spinning reel. 4,601,437, Cl. 242-84.50A.
Yoshino, Hisakazu; Nishimura, Shinichi; and Kazutoshi, Takagi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Stereo-microscope with a common objective lens system. 4,601,550, Cl. 350-516.000.
Young, John N., to Charles C. Worth Corporation. Bait casting reel with braking device. 4,601,438, Cl. 242-84.52C.
Young, Philip J.: *See*—
Riley, Eric K.; Dudill, Roger; and Young, Philip J., 4,601,655, Cl. 431-116.000.
Youngstrand, Richard H., to Olin Corporation. Vinsol coating in sweetie barrel. 4,601,767, Cl. 149-109.600.
Ytter, Willy, to Extraversion, Inc. Display device. 4,601,524, Cl. 312-114.000.
Yuasa, Yoshio; and Kawagoe, Nobukazu, to Minolta Camera Kabushiki Kaisha. Exposure determining device for an enlarger. 4,601,571, Cl. 355-38.000.
Yuka Badische Co., Ltd.: *See*—
Endo, Hiroshi; Matsui, Hiroshi; and Suzuki, Takanori, 4,602,047, Cl. 521-58.000.
Yukawa, Akira, to NEC Corporation. Voltage comparator circuit. 4,602,167, Cl. 307-355.000.
Yurick, Stephen J., Jr. Ski edge tuning tool. 4,601,220, Cl. 76-83.000.
Zaiser, Adolf; Raichle, Dieter; Schwaiger, Helmut; Hermann, Adolf; and Bischof, Edgar, to Karl M. Reich Maschinenfabrik Gesellschaft mit beschraenkter Haftung. Handheld planer. 4,601,104, Cl. 30-475.000.
Zaman, Mohammad F.; and Peppler, Dennis L., to Essex Group, Inc. Apparatus and method for applying high solids enamels to wire. 4,601,918, Cl. 427-120.000.
Zamburro, Frank. Water purifying apparatus. 4,601,822, Cl. 210-192.000.
Zanatta, Ruggero, to Calzaturificio Tecnica spa. Ski-boot with a boot leg having adjustable side inclination. 4,601,118, Cl. 36-120.000.
Zangrando, Roy A., to United States of America, Army. Pneumatic key lock. 4,601,183, Cl. 70-275.000.
Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., to General Foods Corporation. 3-hydroxy-4-alkyloxyphenyi neterocyclic aromatic carboxylates. 4,602,095, Cl. 548-532.000.
Zapfe, Hans: *See*—
Wirz, Peter, 4,601,806, Cl. 204-298.000.
Zapp, Regie H.: *See*—
Halm, Roland L.; Wilding, Oliver K., Jr.; and Zapp, Regie H., 4,602,101, Cl. 556-472.000.
Zaschke, Horst: *See*—
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; Enzenberg, Hartmut; and Isenberg, Andreas, 4,601,846, Cl. 252-299.100.
Zavod "Avtomatika": *See*—
Peev, Jivko N.; and Siderov, Penko M., 4,601,129, Cl. 47-6.000.
Zayatz, Robert A., to Wilson Greatbatch Ltd. Anode assembly for lithium-halogen cell. 4,601,962, Cl. 429-211.000.
Zehler, Eugene R.; and Flake, Clark J., to National Distillers and Chemical Corp. Mist lubrication process. 4,601,840, Cl. 252-56.00S.
Zenith Electronics Corporation: *See*—
Everett, Peter G., 4,602,288, Cl. 358-197.000.
Fockens, Pieter, 4,602,287, Cl. 358-197.000.
Kelly, Gordon E.; and Nakanishi, Mutsuo, 4,602,284, Cl. 358-122.000.
Zerega, Francesco: *See*—
Cecchin, Giuliano; Guglielmi, Floriano; and Zerega, Francesco, 4,602,077, Cl. 526-339.000.
Zeroni, Ludwig: *See*—
Pertzsch, Albert; Liepold, August; Brunner, Hubert; and Zeroni, Ludwig, 4,602,303, Cl. 360-74.600.
Ziemann, Heinz; and Mohrmann, Karl-Heinrich, to Bayer Aktiengesellschaft. Substituted 5-cycloalkyl-2,2-di-methyl-pentan-3-ones. 4,602,115, Cl. 568-376.000.
Zimany, Edward J., Jr.: *See*—
Kim, Suk K.; and Zimany, Edward J., Jr., 4,602,207, Cl. 323-313.000.
Zimmerman, Harold M. Fine and coarse aggregates conveying apparatus. 4,601,629, Cl. 414-327.000.
Zingler, Christian J., to Electric Power Research Institute, Inc. Ribbon casting apparatus with magnetic retainer and resilient spacer. 4,601,326, Cl. 164-502.000.
Zinman, Bernard: *See*—
Albisser, Anthony M.; and Zinman, Bernard, 4,601,707, Cl. 604-131.000.
Zolnowsky, John: *See*—
LaViolette, William P.; Mothersole, David S.; and Zolnowsky, John, 4,602,327, Cl. 364-200.000.
Zussman, Melvin P., to Westinghouse Electric Corp. Polybutadiene-epoxy-anhydride laminating resins. 4,601,944, Cl. 428-251.000.
Zutter, Hans: *See*—
Simon, Lionel N.; Mueller, Hans-Rudolf; and Zutter, Hans, 4,602,089, Cl. 544-265.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF JULY, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brown, Garrett W. Equipment for use with hand held motion picture cameras. Re. 32,213, Cl. 352-243.000.

d'Autry, Eric J. H. Device for ejecting the removable tip of a pipette. Re. 32,210, Cl. 73-864.140.

DeVlieg Machine Company: *See*—
Jerue, Richard A.; and Ortlieb, Robert M., Re. 32,211, Cl. 82-1.200.

Electronics Stamping Corporation: *See*—
Walter, Leo; and Greul, Helmut W., Re. 32,212, Cl. 339-17.00C.

Greul, Helmut W.: *See*—
Walter, Leo; and Greul, Helmut W., Re. 32,212, Cl. 339-17.00C.

Henke-Sass, Wolf GmbH: *See*—
Schramm, Heinrich W., Re. 32,214, Cl. 604-232.000.

Jerue, Richard A.; and Ortlieb, Robert M., to DeVlieg Machine Company. Machine tool and method. Re. 32,211, Cl. 82-1.200.

Ortlieb, Robert M.: *See*—
Jerue, Richard A.; and Ortlieb, Robert M., Re. 32,211, Cl. 82-1.200.

Rhone-Poulenc Agrochimie: *See*—
Theissen, Robert J., Re. 32,215, Cl. 71-98.000.

Schramm, Heinrich W., to Henke-Sass, Wolf GmbH. Pistol-type syringe. Re. 32,214, Cl. 604-232.000.

Theissen, Robert J., to Rhone-Poulenc Agrochimie. Substituted phenoxybenzoic acids compositions of the same and herbicidal use thereof. Re. 32,215, Cl. 71-98.000.

Walter, Leo; and Greul, Helmut W., to Electronics Stamping Corporation. Compliant backplane electrical connector. Re. 32,212, Cl. 339-17.00C.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Adolfsson, Rune F. R.; and Gellert, Dietrich W., to Thorn Svenska A.B. Appliance for making an aerated beverage. B1 4,298,551, 7-22-86, Cl. 261-121.00R.

Amstutz, Edwin A.: *See*—
Harte, Richard A.; Amstutz, Edwin A.; Bigliardi, Achille M., III; and Johnson, William M., B1 3,792,272, Cl. 250-343.000.

Bigliardi, Achille M., III: *See*—
Harte, Richard A.; Amstutz, Edwin A.; Bigliardi, Achille M., III; and Johnson, William M., B1 3,792,272, Cl. 250-343.000.

Champion Brass Mfg. Co.: *See*—
Citron, Manning, B1 4,220,283, Cl. 239-205.000.

Citron, Manning, to Champion Brass Mfg. Co. Vegetation sprinkler having a hand adjustment to direct the spray. B1 4,220,283, 7-22-86, Cl. 239-205.000.

CMI Inc.: *See*—
Harte, Richard A.; Amstutz, Edwin A.; Bigliardi, Achille M., III; and Johnson, William M., B1 3,792,272, Cl. 250-343.000.

Gellert, Dietrich W.: *See*—
Adolfsson, Rune F. R.; and Gellert, Dietrich W., B1 4,298,551, Cl. 261-121.00R.

Harte, Richard A.; Amstutz, Edwin A.; Bigliardi, Achille M., III; and Johnson, William M., to CMI Inc. Breath test device for organic components, including alcohol. B1 3,792,272, 7-22-86, Cl. 250-343.000.

Hirata, Sadao: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, B1 4,478,889, Cl. 427-230.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Tsuboi, Masaharu, B1 4,462,482, Cl. 180-230.000.

Jadach, Albert A., to Towne Robinson Fastener Company. Wheel nut with welded cap. B1 4,123,961, 7-22-86, Cl. 411-429.000.

Johnson, William M.: *See*—
Harte, Richard A.; Amstutz, Edwin A.; Bigliardi, Achille M., III; and Johnson, William M., B1 3,792,272, Cl. 250-343.000.

Kostner, Richard C.: *See*—
Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., B1 4,244,768, Cl. 156-293.000.

Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, to Toyo Seikan Kaisha, Ltd. Process for preparation of coated plastic container. B1 4,478,889, 7-22-86, Cl. 427-230.000.

Miller, Delmar S.: *See*—
Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., B1 4,244,768, Cl. 156-293.000.

Olympian Stone Company: *See*—
Robinson, Ralph C., B1 4,404,158, Cl. 264-263.000.

Poly-Trusions, Inc.: *See*—
Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., B1 4,244,768, Cl. 156-293.000.

Rist, Michel, to Societe Anonyme Francaise Du Ferodo. Torsion damping device. B1 3,817,362, 7-22-86, Cl. 192-106.100.

Robinson, Ralph C., to Olympian Stone Company. Method of making a building panel. B1 4,404,158, 7-22-86, Cl. 264-263.000.

Societe Anonyme Francaise Du Ferodo: *See*—
Rist, Michel, B1 3,817,362, Cl. 192-106.100.

Tanikawa, Isao: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, B1 4,478,889, Cl. 427-230.000.

Thorn Svenska A.B.: *See*—
Adolfsson, Rune F. R.; and Gellert, Dietrich W., B1 4,298,551, Cl. 261-121.00R.

Towne Robinson Fastener Company: *See*—
Jadach, Albert A., B1 4,123,961, Cl. 411-429.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Maruhashi, Yoshitsugu; Tanikawa, Isao; and Hirata, Sadao, B1 4,478,889, Cl. 427-230.000.

Tsuboi, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Motorized two-wheeled vehicle. B1 4,462,482, 7-22-86, Cl. 180-230.000.

Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., to Poly-Trusions, Inc. Method of manufacturing a grating constructed of resin bonded fibers. B1 4,244,768, 7-22-86, Cl. 156-293.000.

Yamamoto, Yujiro. Interview machine. B1 3,747,228, 7-22-86, Cl. 434-320.000.

LIST OF DESIGN PATENTEES

A P Products Incorporated: *See*—
Kurylo, Oryst P.; and Ignasiak, Martin C., 284,734, Cl. D8-52.000.

Akiyama, Joseph S. Spelling game educational unit. 284,775, 7-22-86, Cl. D19-64.000.

Amerock Corporation: *See*—
Clayton, LaVerne E., 284,737, Cl. D8-317.000.

Ampex Corporation: *See*—
McKinnon, Raymond J., Jr., 284,776, Cl. D19-88.000.

Anthony, Alfred A. Holder for a multiple photograph and information mat and telephone directory. 284,777, 7-22-86, Cl. D19-91.000.

Appel, Mel, to Mel Appel Company, The. Mug. 284,726, 7-22-86, Cl. D7-5.000.

Associated Images, Inc.: *See*—
Clifford, James W.; and Eaton, Rodney I., 284,778, Cl. D20-10.000.

AT&T Technologies, Inc.: *See*—
Felix, Christian J.; Genaro, Donald M.; and Sylvester, Gordon E., 284,764, Cl. D14-60.000.

Banning Enterprises, Ltd.: *See*—
Yoshinaga, Sadao, 284,796, Cl. D27-41.000.

Beckerman, Zvi. Dispenser for metal foil, paper or the like. 284,722, 7-22-86, Cl. D6-520.000.

Bernhardt Industries, Inc.: *See*—
Keller, Huey T., 284,719, Cl. D6-446.000.

Bloom, Stephen A., to No Fraud International, Inc. Embossing device. 284,772, 7-22-86, Cl. D18-14.000.

Bottoms, James D. Protective fighting boot. 284,711, 7-22-86, Cl. D2-271.000.

Brentham, Jerry D. Dual seat physical exerciser. 284,780, 7-22-86, Cl. D21-195.000.

Bridgestone Tire Company Limited: *See*—
Kawabata, Misao; and Yamaguchi, Koujiro, 284,750, Cl. D12-147.000.

Brinker, Barry, to 'totes', incorporated. Umbrella handle. 284,713, 7-22-86, Cl. D3-12.000.

Cahuzak, Piet C., to Intradal Nederland B.V. Combined air freshener dispenser and wall-mounted support therefor. 284,788, 7-22-86, Cl. D23-150.000.

Carter, Clyde L. Tissue box holder. 284,721, 7-22-86, Cl. D6-518.000.

Cavalli, Alfredo. Steam iron. 284,800, 7-22-86, Cl. D32-70.000.

Chai, Roung-Chung. Lawn mower. 284,766, 7-22-86, Cl. D15-16.000.

Chinon Kabushiki Kaisha: *See*—
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Clark, Richard H.; Ege, Frank E.; and Lundie, William R., to Deere & Company. Planter row shank mounting bracket. 284,767, 7-22-86, Cl. D15-33.000.

Clark, Robert F.; and Smythe, Hugh A. Neck support rest. 284,724, 7-22-86, Cl. D6-596.000.

Clayton, LaVerne E., to Amerock Corporation. Pull. 284,737, 7-22-86, Cl. D8-317.000.

Clifford, James W.; and Eaton, Rodney I., to Associated Images, Inc. Advertising display unit. 284,778, 7-22-86, Cl. D20-10.000.

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Doman, Donald W.; Davis, William R.; and Van De Wege, Mark D., to Kohler Co. Valve handle. 284,786, 7-22-86, Cl. D23-28.000.

Dorelli, John. Toy dump truck. 284,779, 7-22-86, Cl. D21-134.000.

Doyel, John S. Steam iron. 284,798, 7-22-86, Cl. D32-69.000.

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Ege, Frank E.: *See*—
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Engel, Herman J. Combined fluorescent lamp and electrical adapter therefor. 284,793, 7-22-86, Cl. D26-3.000.

Felix, Christian J.; Genaro, Donald M.; and Sylvester, Gordon E., to AT&T Technologies, Inc. Telephone cradle. 284,764, 7-22-86, Cl. D14-60.000.

Fenne, Kenneth R., to Pittway Corporation. Smoke detector. 284,748, 7-22-86, Cl. D10-106.000.

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401	4,601,166
	4,601,167

CLASS 60

299	4,601,168
406	4,601,169
513	4,601,170
521	4,601,171
	4,601,172
667	4,601,173

CLASS 62

17	4,601,738
20	4,601,739
50	4,601,175
66	4,601,174
138	4,601,176
149	4,601,177
347	4,601,178
475	4,601,179

CLASS 65

2	4,601,740
4.4	4,601,741
14	4,601,742
162	4,601,743

CLASS 66

121	4,601,180

CLASS 68

18 C	4,601,181

CLASS 70

252	4,601,182
275	4,601,183
360	4,601,184
456 R	4,601,185

CLASS 71

88	4,601,745
92	4,601,746
	4,601,747
94	4,601,748
98	Re.32,215

CLASS 72

21	4,601,186
64	4,601,187
243	4,601,188
326	4,601,189
347	4,601,190
354	4,601,191
377	4,601,192

CLASS 73

35	4,601,193
40.7	4,601,194
60	4,601,195
115	4,601,196
117.3	4,601,197
118	4,601,198
	4,601,199
290 V	4,601,200
304 C	4,601,201
431	4,601,202
432 R	4,601,203
	4,601,204
505	4,601,205
514	4,601,206
597	4,601,207
829	4,601,208
861.17	4,601,209
861.27	4,601,210
863.33	4,601,211
864.14	Re.32,210
864.18	4,601,212

CLASS 74

23	4,601,213
477	4,601,214
492	4,601,215
640	4,601,216
701	4,601,217
785	4,601,218
867	4,601,219

CLASS 75

10.22	4,601,752
53	4,601,749
65 R	4,601,750
130 R	4,601,751
251	4,601,753
252	4,601,754

CLASS 76

83	4,601,220

CLASS 81

418	4,601,221

CLASS 82

1.2	Re.32,211
4 C	4,601,222
82	4,601,223

CLASS 83

74	4,601,224
175	4,601,225
403	4,601,227
415	4,601,226
862	4,601,228

CLASS 84

1.01	4,601,229

CLASS 89

1.2	4,601,230

CLASS 91

26	4,601,231

CLASS 92

24	4,601,232
52	4,601,233
88	4,601,234
245	4,601,235

CLASS 98

115.2	4,601,236

CLASS 99

349	4,601,237

CLASS 100

45	4,601,238

CLASS 101

76	4,601,239
91	4,601,240
93.04	4,601,241
348	4,601,242

CLASS 102

200	4,601,243

CLASS 105

240	4,601,244
377	4,601,245

CLASS 106

3	4,601,755
22	4,601,756
90	4,601,758
183	4,601,757
308 M	4,601,759

CLASS 108

144	4,601,246
152	4,601,247

CLASS 111

52	4,601,248

CLASS 112

121.14	4,601,249
184	4,601,250

CLASS 114

23	4,601,251
230	4,601,252
362	4,601,253

CLASS 116

34 R	4,601,254
173	4,601,255

CLASS 118

126	4,601,256
411	4,601,257
652	4,601,258
658	4,601,259
718	4,601,260

CLASS 119

29	4,601,261

CLASS 122

7 R	4,601,262
13 A	4,601,263

CLASS 123

41.27	4,601,264
41.28	4,601,265
90.15	4,601,266
90.33	4,601,267
90.55	4,601,268
300	4,601,269
357	4,601,270
361	4,601,271
425	4,601,272
440	4,601,273
450	4,601,274
468	4,601,275
489	4,601,276
571	4,601,277

CLASS 124

57	4,601,278

CLASS 126

21 A	4,601,279
121	4,601,280
437	4,601,281
440	4,601,282

CLASS 128

4	4,601,283
6	4,601,284
94	4,601,285
132 D	4,601,286
204.17	4,601,287
303.1	4,601,288
305	4,601,289
	4,601,290
419 PT	4,601,291
635	4,601,293
642	4,601,294
660	4,601,292
746	4,601,295
804	4,601,296

CLASS 131

109.1	4,601,297
336	4,601,298

CLASS 132

7	4,601,299

CLASS 134

95	4,601,300

CLASS 135

25 R	4,601,301
66	4,601,302

CLASS 136

256	4,602,120

CLASS 137

3	4,601,303
91	4,601,306
246.22	4,601,307
315	4,601,304
	4,601,308
514	4,601,309
528	4,601,305
556	4,601,310
625.66	4,601,311

CLASS 138

97	4,601,312

CLASS 139

194	4,601,313
429	4,601,314

CLASS 141

231	4,601,315

CLASS 144

28.72	4,601,316
178	4,601,317

CLASS 148

1.5	4,601,760
9 R	4,601,761
9.5	4,601,762
23	4,601,763
101	4,601,764
104	4,601,765
111	4,601,766

CLASS 149

109.6	4,601,767

CLASS 150

52 J	4,601,318

CLASS 156

73.5	4,601,768
169	4,601,769
171	4,601,770
215	4,601,771
293	B1 4,244,768
382	4,601,772
403	4,601,773
433	4,601,774
523	4,601,775
584	4,601,776
626	4,601,777
628	4,601,778
	4,601,779
642	4,601,780
643	4,601,781
	4,601,782
655	4,601,783
	4,601,784

CLASS 160

178 B	4,601,319
271	4,601,320

CLASS 162

30.1	4,601,786
45	4,601,787
199	4,601,785

CLASS 164

155	4,601,321
286	4,601,322
312	4,601,323
432	4,601,324
476	4,601,325
502	4,601,326
	4,601,327

CLASS 165

12	4,601,328
22	4,601,329
95	4,601,330
104.33	4,601,331
165	4,601,332

CLASS 166

115	4,601,333
241	4,601,334
242	4,601,335
252	4,601,336
263	4,601,337
278	4,601,338
281	4,601,339
294	4,601,340
321	4,601,341
323	4,601,342
382	4,601,343

CLASS 169

47	4,601,344
53	4,601,345

CLASS 172

7	4,601,346
134	4,601,347

CLASS 173

25	4,601,348
116	4,601,349
117	4,601,350
	4,601,351
124	4,601,352

CLASS 174

25 R	4,602,121
52 R	4,602,122
72 R	4,602,123
101	4,602,124
138 G	4,602,125

CLASS 175

41	4,601,353
46	4,601,354

CLASS 177

2	4,601,355
211	4,601,356

CLASS 178

18	4,602,126

CLASS 179

2 A	4,602,127
10	4,602,128
18 B	4,602,129
18 FA	4,602,130
84 VF	4,602,131
99 R	4,602,132
170.2	4,602,133
175.1 R	4,602,134

CLASS 180

140	4,601,357
141	4,601,358
230	B1 4,462,482
233	4,601,359

294 4,601,360

CLASS 181

141 4,601,361
208 4,601,362
280 4,601,363

CLASS 182

187 4,601,364
230 4,601,365

CLASS 187

17 4,601,366

CLASS 188

376 4,601,367

CLASS 192

3.3 4,601,368
3.58 4,601,369
8 R 4,601,370
52 4,601,371
67 R 4,601,372
70.18 4,601,373
85 AA 4,601,375
85 CA 4,601,374
89 B 4,601,376
4,601,379
106.1 B1 3,817,362
110 R 4,601,377
115 4,601,378

CLASS 194

318 4,601,380

CLASS 196

114 4,601,381

CLASS 198

432 4,601,382
448 4,601,383
481.1 4,601,384
495 4,601,385
576 4,601,386
626 4,601,387
726 4,601,388
804 4,601,389

CLASS 200

5 A 4,602,135
50 A 4,602,136
76 4,602,137
340 4,602,138

CLASS 202

153 4,601,788
167 4,601,789

CLASS 203

6 4,601,790
51 4,601,791

CLASS 204

1 T 4,601,792
4,601,793
15 4,601,794
16 4,601,795
33 4,601,796
59 R 4,601,797
61 4,601,798
181.8 4,601,799
182.4 4,601,800
206 4,601,801
212 4,601,802
224 M 4,601,803
244 4,601,804
255 4,601,805
298 4,601,806
4,601,807
301 4,601,808
406 4,601,809
413 4,601,810

CLASS 206

175 4,601,390
314 4,601,391
349 4,601,392
505 4,601,393

CLASS 208

22 4,601,813
113 4,601,814
120 4,601,815
253 4,601,816
262 4,601,817
410 4,601,811
4,601,812

CLASS 209

3.3 4,601,394
166 4,601,818
273 4,601,819
526 4,601,395
569 4,601,396
608 4,601,397

CLASS 210

94 4,601,820
169 4,601,821
192 4,601,822
222 4,601,823
232 4,601,824
287 4,601,825
340 4,601,826
500.33 4,601,827
635 4,601,828
638 4,601,829
647 4,601,830
692 4,601,831
717 4,601,832
744 4,601,833
748 4,601,834

CLASS 211

46 4,601,398
60.1 4,601,399
70.7 4,601,400

CLASS 212

180 4,601,401
189 4,601,402

CLASS 215

228 4,601,403
230 4,601,404

CLASS 219

10.43 4,602,139
10.51 4,602,140
10.55 D 4,602,141
69 C 4,602,142
225 4,602,143
230 4,602,144
297 4,602,145
373 4,602,146
509 4,602,147
535 4,602,148

CLASS 220

1.5 4,601,405
66 4,601,406
443 4,601,407

CLASS 221

168 4,601,408

CLASS 222

1 4,601,409
92 4,601,410
207 4,601,411
256 4,601,412
498 4,601,413
564 4,601,414
597 4,601,415
600 4,601,416

CLASS 223

85 4,601,417

CLASS 224

222 4,601,418
318 4,601,419

CLASS 226

154 4,601,420
173 4,601,421

CLASS 228

44.3 4,601,422
121 4,601,423
124 4,601,424

CLASS 229

17 G 4,601,425

CLASS 235

379 4,602,149
382 4,602,150
383 4,602,151
463 4,602,152

CLASS 237

59 4,601,426

CLASS 239

11 4,601,427
205 B1 4,220,283
427.3 4,601,428

CLASS 241

92 4,601,429
101.2 4,601,430
172 4,601,431

CLASS 242

4 R 4,601,433
7.03 4,601,432
35.5 A 4,601,434
56 R 4,601,441
56.4 4,601,435
59 4,601,436
84.5 A 4,601,437
84.52 B 4,601,439
84.52 C 4,601,438
96 4,601,440

CLASS 244

3.24 4,601,442
13 4,601,443
26 4,601,444
129.5 4,601,446
137 A 4,601,445

CLASS 248

49 4,601,447
56 4,601,448
58 4,601,449
71 4,601,450
74.1 4,601,451
178 4,601,452
329 4,601,453
418 4,601,454
429 4,601,455

CLASS 249

91 4,601,456

CLASS 250

201 4,602,153
227 4,602,154
231 SE 4,602,155
327.2 4,602,156
4,602,157
338 4,602,158
4,602,159
341 4,602,160
343 B1 3,792,272
423 R 4,602,161
436 4,602,162
561 4,602,163

CLASS 251

63 4,601,457
129.19 4,601,458
306 4,601,459

CLASS 252

8.55 C 4,601,836
8.9 4,601,835
40.7 4,601,837
49.3 4,601,838
51.5 A 4,601,839
56 S 4,601,840
62.9 4,601,841
70 4,601,842
78.5 4,601,843
95 4,601,844
99 4,601,845
299.1 4,601,846
312 4,601,847
500 4,601,849
503 4,601,848
522 R 4,601,850
4,601,851

CLASS 260

239 R 4,601,853
239.5 4,601,854
239.55 C 4,601,855
419 4,601,856
428.5 4,601,857
550 4,601,860

CLASS 261

121 R B1 4,298,551

CLASS 264

1.6 4,601,861
3.1 4,601,862
4.3 4,601,863
37 4,601,864
40.3 4,601,865
109 4,601,866
227 4,601,867
263 B1 4,404,158
504 4,601,868
523 4,601,869
572 4,601,870

CLASS 266

216 4,601,460

CLASS 267

64.15 4,601,461

CLASS 270

12 4,601,462

CLASS 271

19 4,601,463

CLASS 272

73 4,601,464
99 4,601,465
118 4,601,466
129 4,602,373
130 4,601,467
4,601,468
146 4,601,469

CLASS 273

142 E 4,601,470
144 B 4,601,471
186 A 4,601,472
272 4,601,473
414 4,601,474

CLASS 277

205 4,601,475
230 4,601,476

CLASS 279

30 4,601,477

CLASS 280

1.13 4,601,478
33.99 H 4,601,479
43.12 4,601,480
47.13 B 4,601,481
265 4,601,482
279 4,601,483
411 C 4,601,484
423 R 4,601,485
460 A 4,601,486
756 4,601,487
810 4,601,488

CLASS 281

21 R 4,601,489

CLASS 283

56 4,601,490

CLASS 285

3 4,601,492
24 4,601,491
53 4,601,493
110 4,601,494
112 4,601,495
156 4,601,496
319 4,601,497
332.3 4,601,498

CLASS 292

36 4,601,499
201 4,601,500
218 4,601,501
252 4,601,502
259 R 4,601,503
334 4,601,504

CLASS 294

26 4,601,505
82.14 4,601,506
86.42 4,601,507

CLASS 296

1 S 4,601,508
22 4,601,509
194 4,601,510
210 4,601,511
221 4,601,512

CLASS 297

270 4,601,513
284 4,601,514
361 4,601,515
441 4,601,516
452 4,601,517

CLASS 299

13 4,601,518

CLASS 301

45 4,601,519

CLASS 303

6 C 4,601,520

CLASS 307

91 4,602,164
141 4,602,165
314 4,602,166
355 4,602,167
4,602,168
359 4,602,169
450 4,602,170
491 4,602,171
494 4,602,172

CLASS 310

1 4,602,173
13 4,602,175
15 4,602,174
51 4,602,176
57 4,602,177
71 4,602,178
178 4,602,179
215 4,602,180
241 4,602,181
313 A 4,602,182
313 B 4,602,183
322 4,602,184

CLASS 312

114 4,601,524
330 R 4,601,523

CLASS 313

25 4,602,185
407 4,602,186
479 4,602,187
487 4,602,188
505 4,602,189

CLASS 315

39.63 4,602,190
76 4,602,191
169.3 4,602,192
170 4,602,193
241 P 4,602,194

CLASS 318

568 4,602,195
603 4,602,196
696 4,602,197
798 4,602,198
4,602,199
4,602,200
811 4,602,201

CLASS 320

2 4,602,202
4,602,203
30 4,602,204
64 4,602,205

CLASS 323

211 4,602,206
313 4,602,207
317 4,602,208
351 4,602,209

CLASS 324

73 R 4,602,210
103 R 4,602,211
126 4,602,216
227 4,602,212
307 4,602,213
309 4,602,214
334 4,602,215

CLASS 329

122 4,602,217

CLASS 330

279 4,602,218

CLASS 331

16 4,602,219
19 4,602,220
117 R 4,602,221
179 4,602,222

CLASS 332

9 R 4,602,223
16 T 4,602,224
19 4,602,225
31 R 4,602,226

CLASS 333

109 4,602,227
194 4,602,228
208 4,602,229

CLASS 335

79 4,602,230
216 4,602,231
222 4,602,232
258 4,602,233
299 4,602,234

CLASS 336

192 4,602,235
216 4,602,236

CLASS 338

20 4,602,237
236 4,602,238
316 4,602,239

CLASS 339

14 R 4,601,527
17 C Re.32,212
17 CF 4,601,526
38 4,601,528
60 M 4,601,529
75 MP 4,601,525
103 M 4,601,530
272 R 4,601,531

CLASS 340

310 R 4,602,240
347 AD 4,602,241
4,602,243
347 DA 4,602,244
347 P 4,602,242
384 R 4,602,245
521 4,602,246
575 4,602,247
601 4,602,248
605 4,602,249
4,602,250
724 4,602,251
825.31 4,602,253
825.48 4,602,254
825.5 4,602,252
825.69 4,602,255
825.72 4,602,256

CLASS 343

5 CM 4,602,257
13 R 4,602,258
359 4,602,259
701 4,602,260

CLASS 346

140 R 4,602,261
160 4,602,262
201 4,602,263
205 4,602,264
210 4,602,265

CLASS 350

1.1 4,601,532
3.7 4,601,533
3.83 4,601,534
96.20 4,601,535
4,601,536
96.27 4,601,537
98 4,601,538
255 4,601,539
266 4,601,540
320 4,601,541
334 4,601,542
4,601,543
4,601,544
339 F 4,601,546
347 V 4,601,545
349 4,601,547
416 4,601,548
432 4,601,549
516 4,601,550
525 4,601,551
551 4,601,552
611 4,601,553
4,601,554

CLASS 351

90 4,601,555
160 R 4,601,556

CLASS 352

140 4,601,557
243 Re

CLASS 35.

27 R 4,601,558
111 4,601,559
122 4,601,560

CLASS 354

149.11 4,601,561
170 4,601,562
195.1 4,601,563
271.1 4,601,564
293 4,601,565
311 4,601,566
443 4,601,567

CLASS 355

8 4,601,568
15 4,601,569
27 4,601,570
38 4,601,571
68 4,601,572
75 4,601,573

CLASS 356

1 4,601,574
124 4,601,575
237 4,601,576
4,601,577
338 4,601,578
346 4,601,579
349 4,601,580
383 4,601,581
414 4,601,582

CLASS 357

20 4,602,266
35 4,602,267
38 4,602,268
42 4,602,269
4,602,270
80 4,602,271

CLASS 358

10 4,602,272
11 4,602,273
4,602,274
4,602,275
27 4,602,276
29 4,602,277
37 4,602,278
86 4,602,279
93 4,602,280
98 4,602,281
110 4,602,282
119 4,602,283
122 4,602,284
160 4,602,285
183 4,602,286
197 4,602,287
4,602,288
213 4,602,289
4,602,290
221 4,602,291
241 4,602,292
280 4,602,293

4,602,294
343 4,602,295

CLASS 360

10.1 4,602,296
14.1 4,602,297
4,602,298
60 4,602,299
4,602,300
69 4,602,301
74.2 4,602,302
74.6 4,602,303
77 4,602,304
97 4,602,305
99 4,602,306
125 4,602,307

CLASS 361

91 4,602,308
210 4,602,309
212 4,602,310
4,602,311
342 4,602,312
4,602,313
386 4,602,314
388 4,602,315
412 4,602,316
413 4,602,317
414 4,602,318

CLASS 362

65 4,602,319
80 4,602,320
268 4,602,321

CLASS 363

127 4,602,322
131 4,602,323

CLASS 364

130 4,602,324
140 4,602,325
158 4,602,326
200 4,602,327
4,602,328
4,602,329
4,602,330
4,602,331
408 4,602,332
414 4,602,333
424 4,602,334
426 4,602,335
456 4,602,336
480 4,602,337
482 4,602,338
490 4,602,339
492 4,602,340
494 4,602,341
498 4,602,342
505 4,602,343
509 4,602,344
513 4,602,345
518 4,602,346
569 4,602,347
581 4,602,348
728 4,602,349
900 4,602,350

CLASS 365

52 4,602,351
114 4,602,352
189 4,602,353
203 4,602,354
206 4,602,355
230 4,602,356

CLASS 366

343 4,601,583

CLASS 367

93 4,602,357

CLASS 368

10 4,601,584
80 4,601,585

CLASS 369

12 4,602,358
58 4,602,359
63 4,602,360
77.2 4,602,361

CLASS 370

54 4,602,362
58 4,602,363
85 4,602,364
89 4,602,365
94 4,601,586
4,602,366
106 4,602,367

CLASS 371

21 4,602,368
25 4,602,369

CLASS 372

45 4,602,370
4,602,371
58 4,602,372

CLASS 374

25 4,601,587
106 4,601,588
208 4,601,589

CLASS 375

17 4,602,374
109 4,602,375

CLASS 376

144 4,601,871
248 4,601,872
308 4,601,873

CLASS 378

26 4,602,378
119 4,602,376
150 4,602,377

CLASS 381

12 4,602,379
13 4,602,380
4,602,381
90 4,602,382

CLASS 382

56 4,602,383

CLASS 384

19 4,601,522
54 4,601,521
99 4,601,590
536 4,601,591
564 4,601,592

CLASS 400

121 4,601,593
196.1 4,601,594
637 4,601,595
697.1 4,601,596

CLASS 401

1 4,601,597
6 4,601,598
99 4,601,599

CLASS 403

56 4,601,602
143 4,601,603
338 4,601,600
359 4,601,601

CLASS 404

69 4,601,604
95 4,601,605

CLASS 405

1 4,601,606
133 4,601,607
169 4,601,608
186 4,601,609
188 4,601,610
215 4,601,611
226 4,601,612
239 4,601,613
261 4,601,614
267 4,601,615
288 4,601,616

CLASS 406

129 4,601,617

CLASS 408

1 R 4,601,618

CLASS 409

180 4,601,619

CLASS 410

22 4,601,620

CLASS 411

182 4,601,621
311 4,601,622
336 4,601,623
373 4,601,624
387 4,601,625
429 B1 4,123,961

CLASS 414

225 4,601,627
250 4,601,628
327 4,601,629
460 4,601,630
509 4,601,631
537 4,601,632
546 4,601,633
687 4,601,626
697 4,601,634
730 4,601,635
733 4,601,636
739 4,601,637

CLASS 416

97 R 4,601,638
230 4,601,639

CLASS 417

12 4,601,640
220 4,601,641
225 4,601,642
247 4,601,643
363 4,601,644

CLASS 418

9 4,601,645
153 4,601,646
259 4,601,647

CLASS 419

23 4,601,874
4,601,875
4,601,876
42 4,601,877
49 4,601,878

CLASS 420

473 4,601,879

CLASS 422

28 4,601,880
67 4,601,881
80 4,601,882
94 4,601,883
113 4,601,884
114 4,601,885
116 4,601,886
150 4,601,887
253 4,601,888

CLASS 423

7 4,601,889
54 4,601,890
305 4,601,891
456 4,601,892

CLASS 424

15 4,601,893
19 4,601,894
35 4,601,895
36 4,601,896
45 4,601,897
52 4,601,898
4,601,899
54 4,601,900
61 4,601,901
70 4,601,902
92 4,601,903
118 4,601,904
195.1 4,601,905
4,601,906

CLASS 425

47 4,601,648
72 R 4,601,649
79 4,601,650
143 4,601,651
425 4,601,923
447 4,601,652
587 4,601,653

CLASS 426

5 4,601,907
52 4,601,908
524 4,601,909
634 4,601,910

CLASS 427

34 4,601,911
35 4,601,912
38 4,601,913
87 4,601,914
96 4,601,915
97 4,601,916
109 4,601,917
120 4,601,918
126.3 4,601,919
150 4,601,920
230 B1 4,478,889
240 4,601,921
248.1 4,601,922

CLASS 428

7 4,601,924
17 4,601,925
35 4,601,926
4,601,927
36 4,601,928
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4,601,930
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40 4,601,934
57 4,601,935
119 4,601,936
132 4,601,937
153 4,601,938
161 4,601,939
178 4,601,940
213 4,601,941
222 4,601,942
246 4,601,943
251 4,601,944
287 4,601,945
323 4,601,946
336 4,601,947
349 4,601,948
374 4,601,949
421 4,601,950
423.4 4,601,951
454 4,601,952
457 4,601,953
522 4,601,954
614 4,601,955
4,601,956
622 4,601,957
672 4,601,958

CLASS 429

56 4,601,959
111 4,601,960
119 4,601,961
211 4,601,962

CLASS 430

69 4,601,963
84 4,601,964
85 4,601,965
107 4,601,967
109 4,601,966
137 4,601,968
192 4,601,969
258 4,601,970
280 4,601,972
4,601,973
296 4,601,971
309 4,601,974
393 4,601,975
496 4,601,976

CLASS 431

1 4,601,654
116 4,601,655
344 4,601,656

CLASS 432

14 4,601,657
37 4,601,658
234 4,601,659
239 4,601,660

CLASS 433

134 4,601,661
226 4,601,662

CLASS 434

33 4,601,663
264 4,601,664
267 4,601,665
320 B1 3,747,228

CLASS 435

13 4,601,977
68 4,601,978
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94 4,601,981
108 4,601,982
115 4,601,983
119 4,601,984
253 4,601,985
255 4,601,986
280 4,601,987

CLASS 440

89 4,601,666

CLASS 441

131 4,601,667

CLASS 446

130 4,601,668
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330 4,601,671
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389 4,601,673
440 4,601,674
449 4,601,675

CLASS 464

24 4,601,676
68 4,601,677
83 4,601,678

CLASS 474

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4,601,680
28 4,601,681
80 4,601,682
135 4,601,683
144 4,601,684
188 4,601,685

CLASS 493

43 4,601,686
89 4,601,687
238 4,601,688
251 4,601,689
309 4,601,690
313 4,601,691
355 4,601,692
370 4,601,693
381 4,601,694
418 4,601,695

CLASS 494

10 4,601,696

CLASS 501

134 4,601,988
136 4,601,989
153 4,601,990
4,601,991

CLASS 502

64 4,601,992
66 4,601,993
111 4,601,994
155 4,601,995
242 4,601,996
263 4,601,997
314 4,601,999
318 4,601,998
335 4,602,000
439 4,602,001

CLASS 514

11 4,602,002
23 4,602,004
26 4,602,003
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63 4,602,006
159 4,602,007
178 4,602,008
179 4,602,009
184 4,602,010
187 4,602,011
202 4,602,012
214 4,602,013
215 4,602,014
234 4,602,016
242 4,602,017
243 4,602,018
248 4,602,019
252 4,602,015
302 4,602,020
336 4,602,021
337 4,602,022
346 4,602,023
357 4,602,024
359 4,602,025
369 4,602,026
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410 4,602,032
452 4,602,033
456 4,602,034
469 4,602,035
494 4,602,036
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521 4,602,038
561 4,602,039
567 4,602,040
634 4,602,041
635 4,602,042
646 4,602,043
653 4,602,044

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58 4,602,047
82 4,602,048
129 4,602,049

CLASS 522

7 4,602,076
135 4,602,050

CLASS 523

137 4,602,051
215 4,602,052
436 4,602,053

CLASS 524

83 4,602,054
157 4,602,055
272 4,602,056
300 4,602,057
320 4,602,058
521 4,602,059
745 4,602,060

CLASS 525

10 4,602,061
61 4,602,062
127 4,602,063
316 4,602,064
326.5 4,602,065
326.7 4,602,066
327.4 4,602,067
356 4,602,068
504 4,602,069
528 4,602,070
4,602,071

CLASS 526

77 4,602,072
208 4,602,073
245 4,602,074
293 4,602,075
339 4,602,077

CLASS 528

34 4,602,078
60 4,602,079
67 4,602,080
337 4,602,081
481 4,602,082
488 4,602,083

CLASS 530

303 4,601,852

CLASS 534

641 4,602,084

CLASS 536

17.2 4,602,085
125 4,602,086

CLASS 544

78 4,602,087
178 4,602,088
265 4,602,089
402 4,602,091

CLASS 546

272 4,602,090

CLASS 548

112 4,602,092
336 4,602,093
406 4,602,094
498 4,602,096
532 4,602,095

CLASS 549

27 4,602,097
266 4,602,114
413 4,602,098
479 4,602,099
529 4,602,100

CLASS 556

472 4,602,101

CLASS 558

281 4,601,858
459 4,601,859

CLASS 560

179 4,602,102
243 4,602,103
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266 4,602,105

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444 4,602,106
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433 4,602,111
474 4,602,112

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387 4,602,116
393 4,602,117
570 4,602,118

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65 4,601,700
83 4,601,701
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131 4,601,707
136 4,601,708
150 4,601,709
165 4,601,710
224 4,601,711
232 Re.32,214
246 4,601,702
251 4,601,712
280 4,601,713
286 4,601,714
321 4,601,715
349 4,601,716
358 A 4,601,717

CLASS 623

1 4,601,718
2 4,601,719
6 4,601,720
4,601,721
4,601,722
10 4,601,723
66 4,601,724

CLASS 671

86 4,601,744

CLASSIFICATION OF DESIGNS

D2—	227	284,708		596	284,724		344	284,740		24	284,756		14	284,772		150	284,788
		284,709		604	284,725		367	284,741		25	284,757	D19—	48	284,773		163	284,789
	241	284,710	D7—	5	284,726		375	284,742		30	284,758		49	284,774	D24—	20	284,790
	271	284,711		21	284,727		378	284,743	D14—	53	284,759		64	284,775		36	284,791
	380	284,712		79	284,728	D10—	33	284,744			284,760		88	284,776	D26—	2	284,792
D3—	12	284,713			284,729		38	284,745			284,761		91	284,777		3	284,793
	38	284,714		309	284,730		64	284,746			284,762	D20—	10	284,778	D27—	41	284,794
	71	284,715	D8—	5	284,731		98	284,747		60	284,763	D21—	134	284,779			284,796
D6—	315	284,716		10	284,732		106	284,748			284,764		195	284,780		51	284,795
	349	284,717			284,733	D12—	92	284,749		70	284,765		196	284,781	D32—	18	284,797
	375	284,718		52	284,734		147	284,750	D15—	16	284,766		202	284,782		69	284,798
	446	284,719		61	284,735		192	284,751		33	284,767		217	284,783		70	284,799
	488	284,720		93	284,736		203	284,752	D16—	6	284,768		230	284,784			284,800
	518	284,721		317	284,737		210	284,753		118	284,769	D23—	7	284,785	D34—	19	284,802
	520	284,722		402	284,738		317	284,754	D18—	12	284,770		28	284,786		28	284,801
	560	284,723	D9—	336	284,739	D13—	9	284,755		13	284,771		123	284,787	D99—	34	284,803

CLASSIFICATION OF PLANTS

P.—	9	5,768		10	5,769			5,770		47	5,771		89	5,772			5,773

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PATENTS

01 : 4,601,675	4,601,307	4,601,821	4,601,828	4,601,394	4,602,044
4,601,862	4,601,312	4,601,871	4,601,893	4,601,425	4,602,101
4,601,891	4,601,318	4,601,882	4,601,897	4,601,450	4,602,276
4,602,134	4,601,331	4,601,969	4,601,945	4,601,620	4,602,324
4,602,216	4,601,344	4,601,978	4,602,049	4,601,625	19 : 4,601,126
4,602,239	4,601,345	4,601,980	4,602,067	4,601,630	4,601,142
02 : 4,602,113	4,601,354	4,601,996	4,602,130	4,601,667	4,601,401
04 : 4,601,124	4,601,356	4,602,029	4,602,146	4,601,679	4,601,634
4,601,138	4,601,359	4,602,030	4,602,340	4,601,704	4,601,833
4,601,399	4,601,363	4,602,052	4,602,362	4,601,757	4,602,248
4,601,591	4,601,382	4,602,089	4,602,363	4,601,771	20 : 4,601,587
4,601,619	4,601,389	4,602,120	4,602,378	4,601,830	4,601,663
4,601,637	4,601,391	4,602,122	4,602,380	4,601,837	4,602,203
4,601,778	4,601,403	4,602,155	10 : 4,601,157	4,601,843	21 : 4,601,285
4,601,842	4,601,409	4,602,166	4,601,827	4,601,860	4,601,483
4,601,915	4,601,418	4,602,168	4,602,046	4,601,861	4,601,691
4,602,131	4,601,438	4,602,175	11 : 4,602,179	4,601,896	4,601,775
4,602,368	4,601,452	4,602,189	12 : 4,601,066	4,601,954	4,602,337
05 : 4,601,624	4,601,468	4,602,197	4,601,069	4,602,111	22 : 4,601,194
4,601,723	4,601,469	4,602,231	4,601,102	4,602,124	4,601,224
4,602,108	4,601,485	4,602,250	4,601,128	4,602,135	4,601,457
06 : Re.32,212	4,601,487	4,602,285	4,601,161	4,602,145	4,601,566
4,601,067	4,601,491	4,602,290	4,601,282	4,602,171	4,601,606
4,601,072	4,601,493	4,602,291	4,601,482	4,602,218	4,601,666
4,601,077	4,601,496	4,602,297	4,601,549	4,602,229	4,601,673
4,601,093	4,601,502	4,602,304	4,601,609	4,602,235	4,602,048
4,601,100	4,601,504	4,602,305	4,601,638	4,602,284	24 : 4,601,503
4,601,112	4,601,533	4,602,331	4,601,640	4,602,287	4,601,585
4,601,121	4,601,541	4,602,350	4,601,709	4,602,288	4,601,684
4,601,130	4,601,545	4,602,360	4,601,724	4,602,317	4,601,761
4,601,131	4,601,551	3,747,228	4,601,767	4,602,343	4,601,795
4,601,137	4,601,557	3,792,272	4,601,949	4,602,379	4,601,903
4,601,140	4,601,565	4,220,283	4,602,060	18 : 4,601,081	4,601,959
4,601,143	4,601,576	4,244,768	4,602,262	4,601,145	4,602,144
4,601,149	4,601,584	08 : 4,601,079	4,602,311	4,601,174	4,602,147
4,601,155	4,601,608	4,601,207	4,602,323	4,601,197	4,602,243
4,601,156	4,601,623	4,601,474	13 : 4,601,185	4,601,226	4,602,245
4,601,173	4,601,646	4,601,814	4,601,727	4,601,237	4,602,357
4,601,175	4,601,671	4,601,914	4,601,730	4,601,265	4,602,375
4,601,203	4,601,689	4,602,128	4,601,740	4,601,317	25 : 4,601,068
4,601,210	4,601,698	4,602,133	4,602,193	4,601,377	4,601,202
4,601,211	4,601,708	4,602,270	14 : 4,601,886	4,601,414	4,601,295
4,601,212	4,601,710	4,602,310	15 : 4,601,776	4,601,481	4,601,516
4,601,229	4,601,712	4,602,335	4,601,910	4,601,499	4,601,521
4,601,238	4,601,716	09 : 4,601,188	16 : 4,601,934	4,601,697	4,601,526
4,601,249	4,601,719	4,601,240	17 : 4,601,119	4,601,699	4,601,542
4,601,261	4,601,720	4,601,270	4,601,153	4,601,705	4,601,553
4,601,268	4,601,754	4,601,299	4,601,170	4,601,750	4,601,554
4,601,278	4,601,770	4,601,460	4,601,236	4,601,766	4,601,579
4,601,281	4,601,782	4,601,478	4,601,242	4,601,838	4,601,586
4,601,293	4,601,783	4,601,489	4,601,244	4,601,918	4,601,706
4,601,294	4,601,784	4,601,507	4,601,250	4,602,008	4,601,731
4,601,305	4,601,811	4,601,803	4,601,372	4,602,025	4,601,732

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51 : 284,712
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